

Paper List of Prof. M. Hayakawa

I 著書, 編書

1. 早川正士 著, 波動工学, コロナ社、1992.
2. Hayakawa, M. and T. Ogawa, Editors, Atmospheric Electricity Phenomena Associated with Earthquakes and Volcanic Eruptions, Special Issue, Res. Lett. Atmos. Electricity, vol. 12, no. 3, 191-281, September, 1992.
3. 早川正士 著, 宇宙からの交響曲 -超高層プラズマ波動-, 新コロナシリーズ 21、コロナ社、1993.
4. Hayakawa, M. and Y. Fujinawa, Editors, Electromagnetic Phenomena Related to Earthquake Prediction, Terra Sci. Pub. Co., Tokyo, pp.667, 1994.
5. Hayakawa, M. 分担執筆, Whistlers, Chapt. 7 in "Handbook of Atmospheric Electrodynamics", Ed. by H.Volland, CRC Press, Boca Raton, 1995.
6. Hayakawa, M., E. K. Smith, and W. J. Borucki, Editors, Special Issue: URSI XXIVth General Assembly, Kyoto 1993, J.Atmos.Terr.Phys., vol. 57, No. 5, 447-585, 1995.
7. Hayakawa, M., Editor, Seismo-Electromagnetic Phenomena, Special Issue, J. Atmos. Electricity, vol. 16, No.3, 161-288, October, 1996.
8. 早川正士, 分担執筆, 地震の科学, 丸善, p. 111-129, p. 130-148, 1996.
9. 早川正士, 最新・地震予知学(電磁波異常でわかる, その前兆), 祥伝社, 平成 8 年 (1996 年).
10. 菊地勝弘, 上田博, 三浦和彦, 河崎善一郎, 成田憲一, 早川正士, 児島紘, 仲野貢, 第 10 回国際大気電気学会(大阪大会)報告, 日本気象学会, Vol. 44, No. 5, 31-44, 1997.
11. Hayakawa, M., Editor, Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes, Terra Sci. Pub. Co., Tokyo, 996p, 1999.
12. 仲野貢, 河崎善一郎, 小林文明, 原健児, 早川正士, 第 11 回国際大気電気学会 (ICAE 9 9)の報告, 天気, 4 7, 7, 507-513, 2000.
13. 早川正士, 分担執筆, 地震に伴う電磁現象, 地震に伴う電磁現象調査専門委員会, 電気学会技術報告書, 836 号, 65p., 2001.
14. Hayakawa, M. and O. A. Molchanov, Editors, Seismo Electromagnetics: Lithosphere - Atmosphere - Ionosphere Coupling, TERRAPUB, Tokyo, 477p, 2002.
15. Hayakawa, M., Guest Editor, Special Issue, "Seismo Electromagnetics", J. Atmos. Electr., 22, No.3, 111~300, 2002
16. Nickolaenko, A. P. and M. Hayakawa, Resonances in the Earth-Ionosphere Cavity, Kluwer Acad. Pub., Dordrecht, pp. 380, 2002.
17. Troyan, V. and M. Hayakawa, Inverse Geophysical Problems, TERRAPUB, Tokyo, pp. 289, 2002
18. 日本大気電気学会編 (分担執筆) 大気電気学概論, コロナ社, 2003

19. 早川正士, 分担執筆, 地球大循環とエルニーニョ, 丸善, p. 61-80, 2003
20. 早川正士, なぜ電磁気で地震の直前予知ができるか, 日本専門図書出版, 平成 15 年 (2003 年).
21. Hayakawa, M., O. A. Molchanov, P. F. Biagi, and F. Vallianatos, Guest Editors, Seismo Electromagnetics and Related Phenomena, Phys. Chem. Earth, Special Issue, Vol. 29, Issues 4-9, pp. 287-662, 2004.
22. Hayakawa, M., M. Matsumoto and Y. Yamasaki, Editors, Special Issue on Recent Progress in Electromagnetic Theory and Its Application, Inst. Electr. Engrs. Japan, Trans. Fundamentals and Materials, vol. 124, No.12, 1079-1254, 2004.
23. 早川正士, 分担執筆, 環境電磁界観測による地震前駆現象の研究, 電気学会技術報告書, 992 号, 2004.
24. Hayakawa, M., S. Pulinets, M. Parrot and O. A. Molchanov, Guest Editors, Special Issue, Recent Progress in Seismo Electromagnetics and Related Phenomena, Phys. Chem. Earth, vol.31, issues 4-9, pp. 129-495, 2006.
25. Korovkin, N. V., V. L. Chechurin and M. Hayakawa, Inverse Problems in Electric Circuits and Electromagnetics, Springer, p.331, 2007.
26. Molchanov, O. A., and M. Hayakawa, Seismo Electromagnetics and Related Phenomena: History and latest results, TERRAPUB, Tokyo, 189 p., 2008.
27. 早川正士, 地球環境とノイズの意外な関係, 技術評論社, 2009.
28. Hayakawa, M. (Editor) , Electromagnetic Phenomena Associated with Earthquakes, Transworld Research Network, Trivandrum(India), 279p., 2009.
29. 早川正士, 地震は予知できる!, KK ベストセラーズ, 2011 年
30. Hayakawa, M. (Editor), The Frontier of Earthquake Prediction Studies, Nihon-senmontosho-Shuppan, Tokyo, 794p., 2012.
31. Hayakawa, M., Y. Hobara, and T. Suzuki, Lightning effects in the mesosphere and ionosphere, in "Lightning Electromagnetics", Ed. by V. Cooray, Chapter 16, Inst. Engineering and Technology, London, UK, 611-646, 2012.
32. Hobara, Y., and M. Hayakawa, The effects of lightning on the ionosphere/magnetosphere, in "Lightning Electromagnetics", Ed. by V. Cooray, Chapter 17, Inst. Engineering and Technology, 647-685, 2012.
33. Hayakawa, M., N. Yonaiguchi, Y. Ida, S. Masuda, and Y. Hobara, Fractal analysis of electromagnetic emissions in possible association with earthquakes, in "Classification and Application of Fractals", Ed. by W. L. Hagen, Nova Sci. Pub., New York, Chapter 3 (83-101), 2012.
34. Hayakawa, M. (Editor), Earthquake Prediction Studies: Seismo Electromagnetics, TERRAPUB, Tokyo, 168p., 2013.
35. Nickolaenko, A. P., and M. Hayakawa, Schumann Resonances for Tyros (Essentials of Global Electromagnetic Resonance in the Earth-Ionosphere Cavity), Springer, Tokyo, 348p., 2014.

36. Surkov, V., and M. Hayakawa, Ultra and Extremely Low Frequency Electromagnetic Fields, Springer, Tokyo, 486p., 2014.

II 解説論文

1. 早川正士, VLF/LF 電離層・大地導波管伝搬波を用いた地震に伴う電離層擾乱の検出, 応用光学, 11月号, 24-30, 2001.
2. 早川正士, 大津山卓哉, 芳原容英, 中村貴弘, 雷・電離層放電に伴う中間圏の発光現象と関連現象, 応用光学, 1月号, 14-21, 2002.
3. 遠藤、田中、早川、湯本、関根、木村、八井、山元、藤原、石井、秋山, 2003年研究開発の動向, 電気学会誌, A部門(基礎・材料)誌, vol. 123, no. 1, 1-11, 2003.
4. 早川正士, 地震に伴う電磁気現象のいろいろ, 電気通信大学紀要, 17巻, 1-9, 2005.
5. 早川正士, 「地震電磁気研究ステーション」の活動について, 電気通信大学紀要, 19巻, 211-215, 2006.
6. 早川正士, 地震電磁気シンポジウム(2006年12月)と地震電磁気現象の最新の成果について, 電気通信大学紀要, 20巻, 31-38, 2007.
7. 早川正士, 地震電磁気研究ステーションの活動報告(平成20年度), 電気通信大学紀要, 21巻, 243-248, 2009.
8. 早川正士, 地震予知研究の動向と電通大地震電磁気研究ステーションの貢献, 電気通信大学紀要, 22巻, 1-7, 2010.
9. 早川正士, 電磁気現象を用いた地震予知研究の動向, 電気学会誌解説, vol. 130, No.7, 431-434, 2010.
10. 早川正士, 地震に伴う電磁気現象と地震予知の展望, 応用物理(応用物理学会誌), 82巻, 3号, 238-242, 2013.

II 学術論文

1. 早川正士, 大津仁助, 岩井 章, 電離層内の円柱状不規則性による電波散乱, 核融合研究, vol. 21, 366-376, 1968.
2. Hayakawa, M., J. Ohtsu, and A. Iwai, Scattering of electromagnetic waves by a cylindrical irregularity immersed in a plasma at oblique incidence, J. Phys. Soc. Japan, vol. 24, 1413, 1968.
3. 早川正士, 大津仁助, 岩井 章, アルフヴェン波の磁気圏内ダクト伝搬, 核融合研究, vol. 22, 308-322, 1969.
4. 早川正士, 大津仁助, 岩井 章, Group propagation in a multi-component magnetoplasma, 核融合研究, vol. 24, 163-177, 1969.
5. Hayakawa, M., Propagation of whistler modes in an inhomogeneous plasma, J. Phys. Soc. Japan, vol. 27, 1373, 1969.
6. Hayakawa, M. and J. Ohtsu, Ducted propagation of hydromagnetic whistlers in the magnetosphere, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 16, 91-100, 1969.
7. Hayakawa, M., J. Ohtsu, and A. Iwai, Electromagnetic wave scattering by ionospheric irregularities, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 16, 53-63, 1969.
8. Hayakawa, M., J. Ohtsu, and A. Iwai, Occurrence rate and dispersion of whistlers during magnetically disturbed periods at lower latitudes, Rep. Ionosph. Space Res. Japan, vol. 23, 9-20, 1969.
9. Hayakawa, M., J. Ohtsu, and A. Iwai, Dispersion of waves in the lower exosphere with multiple ionic species, Rep. Ionosph. Space Res. Japan, vol. 23, 233-246, 1969.
10. Hayakawa, M., J. Ohtsu, and A. Iwai, Penetration of whistlers through the ionosphere, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 16, 183-190, 1969.
11. Ohtsu, J., M. Hayakawa, and A. Iwai, Whistler propagation in magnetically disturbed periods at two lower latitudes, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 16, 101-111, 1969.
12. 早川正士, 大津仁助, 岩井 章, 電離層内における VLF 帯電波観測, 東京大学宇宙研報告, vol. 6, 156-167, 1970.
13. 早川正士, 大津仁助, 岩井 章, ホイッスラによる電離層電子密度の測定, 電子通信学会論文誌, vol. 53-B, 477-478, 1970.
14. Hayakawa, M. and A. Iwai, Plasma-induced radio frequency interferences from space vehicle, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 17, 99-106, 1970.
15. Hayakawa, M. and J. Ohtsu, Rocket observation of VLF radio waves in the ionosphere, Proc. Res. Inst. Atmospheric, Nagoya Univ., vol. 17, 83-98, 1970.
16. Hayakawa, M., J. Ohtsu, and A. Iwai, Rocket observation of very low frequency radio waves in the ionosphere, Rep. Ionosph. Space Res. Japan, vol. 24, 13-23, 1970.
17. Hayakawa, M. and J. Ohtsu, Wave interference effect in whistler mode reflection coefficients for model lower ionosphere, J. Geomagn. Geoelectr., vol. 23, 419-422, 1971.

18. Hayakawa, M., J. Ohtsu, and A. Iwai, Characteristics of dispersion and occurrence rate of whistlers at low latitudes during one solar cycle, *J. Geomagn. Geoelectr.*, vol. 23, 187-204, 1971.
19. Hayakawa, M. and J. Ohtsu, Transmission and reflection of magnetospheric whistlers in the ionosphere and lower exosphere at high latitude, *Planet. Space Sci.*, vol. 20, 1895-1907, 1972.
20. Hayakawa, M. and J. Ohtsu, On the reflection of whistler mode waves from model lower ionospheres, *Proc.Res.Inst.Atmospherics, Nagoya Univ.*, vol. 19, 21-32, 1972.
21. 早川正士, 低緯度ホイ斯拉のダクト伝搬, *電子通信学会論文誌*, vol. 53-B, 34-35, 1973.
22. Hayakawa, M., The reflection mechanism of VLF waves in the lower ionosphere, *IEEE Trans. Ant. & Prop.*, vol. AP-21, 915-916, 1973.
23. Hayakawa, M. and J. Ohtsu, Annual and semi-annual variation in the electron density of the inner magnetosphere deduced from whistler dispersion, *J. Atmos. Terr. Phys.*, vol. 35, 339-345, 1973.
24. Hayakawa, M. and J. Ohtsu, Ducted propagation of low-latitude whistlers deduced from simultaneous observations at multi-stations, *J. Atmos. Terr. Phys.*, vol. 35, 1685-1697, 1973.
25. Hayakawa, M. and J. Ohtsu, Tunneling transmission through the equatorial ionosphere of ELF and VLF electromagnetic waves, *J. Atmos. Terr. Phys.*, vol. 35, 851-860, 1973.
26. Hayakawa, M. and Y. Tanaka, Equatorial field-aligned irregularities deduced from the echo-train and hybrid whistlers, *Pure & Appl. Geophys.*, vol. 111, 2336-2340, 1973.
27. Hayakawa, M. and Y. Tanaka, Properties of low-latitude whistler ducts inferred from a comparison of ground whistler dispersion and magnetospheric electron density profile, *Rep. Ionosph. Space Res. Japan*, vol. 27, 213-217, 1973.
28. Tanaka, Y. and M. Hayakawa, The effect of geomagnetic disturbance on the duct propagation of low-latitude whistlers, *J. Atmos. Terr. Phys.*, vol. 35, 1699-1703, 1973.
29. Tanaka, Y. and M. Hayakawa, Storm-time characteristics of low latitude whistlers, *Planet. Space Sci.*, vol. 21, 1797-1798, 1973.
30. Hayakawa, M., J. Ohtsu, and A. Iwai, On the propagation of ionospheric whistlers at low latitudes, *J. Atmos. Terr. Phys.*, vol. 35, 1677-1684, 1973.
31. 早川正士, 下降ホイ斯拉波の電離層内反射機構について, *電子通信学会論文誌*, vol. 57-B, 177-182, 1974.
32. 早川正士, 大津仁助, 岩井 章, 低緯度ホイ斯拉のロケット観測及びその磁気圏・電離層内伝搬特性について, *電子通信学会論文誌*, vol. 57-B, 742-749, 1974.
33. Hayakawa, M., Non-ducted two-hop whistlers in the inner plasmasphere deduced from rocket measurement, *Planet. Space Sci.*, vol. 22, 638-642, 1974.
34. Hayakawa, M., On the ionospheric reflection of downcoming whistlers including the ground reflection, *Pure & Appl. Geophys.*, vol. 112, 513-517, 1974.

35. Iwai, A., T. Okada, and M. Hayakawa, Rocket measurement of wave normal directions of low latitude sunset whistlers, *J. Geophys. Res.*, vol. 79, 3870-3873, 1974.
36. Tanaka, Y., M. Hayakawa, and J. Ohtsu, VLF hiss observed at a low latitude ground station and its relation to drifting ring current electrons, *Rep. Ionosph. Space Res. Japan*, vol. 28, 168-174, 1974.
37. Hayakawa, M. and A. Iwai, Magnetospheric ducting of low-latitude whistlers as deduced from the rocket measurement of their wave normal directions, *J. Atmos. Terr. Phys.*, vol. 37, 1211-1218, 1975.
38. Hayakawa, M., Y. Tanaka, and J. Ohtsu, Satellite and ground observations of magnetospheric VLF hiss associated with the severe magnetic storm on May 25-27, 1967, *J. Geophys. Res.*, vol. 80, 86-92, 1975.
39. Hayakawa, M., Y. Tanaka, and J. Ohtsu, The morphologies of low-latitude and auroral VLF 'hiss', *J. Atmos. Terr. Phys.*, vol. 37, 517-529, 1975.
40. 岩井 章, 岡田敏美, 早川正士, 電離層内における低緯度ホイストラの波面法線方向の測定, *電子通信学会論文誌*, vol. 59-B, 181-187, 1976.
41. Tanaka, Y., M. Hayakawa, and M. Nishino, Study of auroral VLF hiss observed at Syowa station, *Memoirs Nat'l Inst. Polar Res. Tokyo*, A-13, pp. 58, 1976.
42. Hayakawa, M. and Y. Tanaka, ELF emissions observed at Moshiri, *Nature (Physical Sci.)*, vol. 270, 703-704, 1977.
43. Hayakawa, M., K. Bullough, and T. R. Kaiser, Properties of storm-time magnetospheric VLF emissions as deduced from the Ariel 3 satellite and ground-based observations, *Planet. Space Sci.*, vol. 25, 353-368, 1977.
44. Okada, T., A. Iwai, and M. Hayakawa, The measurement of incident and azimuthal angles and the polarization of whistlers at low latitudes, *Planet. Space Sci.*, vol. 25, 233-241, 1977.
45. Hayakawa, M. and S. Shimakura, On the mechanism of reflection of ELF-LF waves from the lower ionosphere, *Inst. Electr. Comm. Engrs. Japan*, vol. 61-E, 15-18, 1978.
46. Hayakawa, M. and Y. Tanaka, On the propagation of low-latitude whistlers, *Rev. Geophys. Space Phys.*, vol. 16, 111-123, 1978.
47. Hasegawa, M., M. Hayakawa, and J. Ohtsu, On the conditions of duct trapping of low-latitude whistlers, *Ann. Geophys.*, vol. 34, 317-324, 1978.
48. Tanaka, Y., M. Hayakawa, and M. Nishino, An observing plan of wave normal direction of auroral VLF emissions on board a rocket at Syowa station, *Memoirs Nat'l Inst. Polar Res. Tokyo*, No. 9, 76-86, 1978.
49. Tanaka, Y., M. Hayakawa, A. Iwai, J. Ohtsu, L. R. O. Storey, C. Beghin, and T. S. Jorgensen, Preliminary report on the simultaneous observations of VLF emissions at Brorfelde (Denmark), Chambon-la-Forêt (France) and Moshiri, *Proc. Res. Inst. Atmospheric*, Nagoya Univ., vol. 25, 7-18, 1978.
50. 岡田敏美, 早川正士, 岩井 章, 森山伸一, ホイストラの伝搬方向、偏波の測定における大地-電離層間多重反射波の影響について, *電子通信学会論文誌*, vol. 62-B, 872-877, 1979.

51. Hayakawa, M. and M. Kashiwagi, Characteristics of mid-latitude VLF emissions and whistlers during the magnetic storm on 14-15 February, 1978, *Solar Terr. Environmental Res. Japan*, vol. 3, 127-133, 1979.
52. Hayakawa, M. and S. Moriyama, The error in whistler direction finding due to multiple rays in the earth-ionosphere waveguide, *Rivista Italiana di Geofisica e Scienze Affini(Italy)*, vol. 5, 125-127, 1979.
53. Moriyama, S., T. Okada, M. Hayakawa, and A. Iwai, The effect of the earth-ionosphere waveguide propagation on the polarization and arrival angles of whistlers, *Proc.Res.Inst.Atmospherics, Nagoya Univ.*, vol. 26, 17-34, 1979.
54. Hasegawa, M. and M. Hayakawa, The influence of the equatorial anomaly on the ground reception of whistlers at low latitudes, *Planet. Space Sci.*, vol. 28, 17-28, 1980.
55. Tanaka, Y. and M. Hayakawa, Longitudinal effect in the enhancement of daytime whistler activity at low latitudes, *Ann. Geophys.*, vol. 36, 577-585, 1980.
56. Yoshida, T., J. Ohtsu, and M. Hayakawa, On the conditions of triggering VLF emissions by a natural whistler, *Proc.Res.Inst.Atmospherics, Nagoya Univ.*, vol.27, 31-48, 1980.
57. Tanaka, Y., M. Hayakawa, J. Ohtsu, and A. Iwai, Secular variation of occurrence rate and dispersion of low latitude whistlers during solar cycles Nos. 19 and 20, *Solar Prediction Proc. (USA)*, vol. 4, D3, 48-54, 1980.
58. Hayakawa, M., T. Okada, and A. Iwai, Direction finding of medium latitude whistlers and their propagation characteristics, *J. Geophys. Res.*, vol.86, 6939-6946, 1981.
59. Okada, T., A. Iwai, and M. Hayakawa, A new whistler direction finder, *J. Atmos. Terr. Phys.*, vol. 43, 679-691, 1981.
60. Hayakawa, M., Y. Tanaka, T. Okada, and A. Iwai, Goniometric direction finding for low latitude whistlers and their propagation mechanism, *J. Geophys. Res.*, vol. 86, 6781-6793, 1981.
61. Hayakawa, M., Y. Tanaka, A. Iwai, J. Ohtsu, L. R. O. Storey, C. Beghin, and T. S. Jorgensen, Simultaneous spaced direction finding measurement of medium-latitude VLF/ELF emissions, *Planet. Space Sci.*, vol. 29, 505-520, 1981.
62. Hayakawa, M., Y. Tanaka, A. Iwai, J. Ohtsu, M. Kashiwagi, and T. Okada, Medium-latitude VLF/ELF emissions as deduced from the multi-stationed direction finding, *Memoirs Nat'l Inst. Polar Res. Tokyo, Special Issue No. 18*, 23-39, 1981.
63. 山中幸雄, 早川正士, 磁気圏 VLF 放射の伝搬方向の測定, *電子通信学会論文誌*, vol. 58-B, 1428-1429, 1983.
64. 岡田敏美, 田中義人, 早川正士, 岩井章, 島倉信, ホイスラの伝搬距離と偏波特性, *電子通信学会論文誌*, vol. 58-B, 1355-1361, 1983.
65. Hayakawa, M., Y. Tanaka, and T. Okada, Time scales of formation, lifetime and decay of whistler ducts at low latitudes, *Ann. Geophysicae*, vol.1, 515-518, 1983.
66. Yoshida, T., J. Ohtsu, and M. Hayakawa, A study of the mechanism of whistler-triggered VLF emissions, *J. Geophys.*, vol. 53, 59-67, 1983.

67. Hayakawa, M., Y. Tanaka, T. Okada, J. Ohtsu, and A. Iwai, Conjugate measurements of LF, VLF, ELF and ULF waves at Moshiri and Bridsville (L=1.59), *Solar Terr. Environmental Res. Japan*, vol. 7, 12-16, 1983.
68. Ohta, K., M. Hayakawa, and Y. Tanaka, Ducted propagation of daytime whistlers as deduced from the ground-based direction finding, *J. Geophys. Res.*, vol. 89, 7557-7564, 1984.
69. Hayakawa, M., Y. Yamanaka, M. Parrot, and F. Lefeuvre, The wave normals of magnetospheric chorus emissions observed on board GEOS-2, *J. Geophys. Res.*, vol. 89, 2811-2821, 1984.
70. Tsuzuku, A., T. Okada, A. Iwai, Y. Tanaka, and M. Hayakawa, An improved real time whistler analyzer using a microcomputer system, *Res. Lett. Atmos. Electr.*, vol. 4, 71-80, 1984.
71. Kurita K. and M. Hayakawa, Evaluation of the effectiveness of theoretical model calculation in determining the plasmopause structure, *J. Geophys.*, vol. 57, 130-135, 1985.
72. Tanaka, Y. and M. Hayakawa, On the propagation of daytime whistlers at low latitudes, *J. Geophys. Res.*, vol. 90, 3457-3464, 1985.
73. Tanaka, Y. and M. Hayakawa, Telemetry reception at Sugadaira of ELF/VLF waves observed by Aureol-3 satellite and the study of magnetospheric plasma waves, *Solar Terr. Environmental Res. Japan*, vol. 9, 12--13, 1985.
74. Hayakawa, M., F. Lefeuvre, and J. L. Rauch, The direction finding aboard Aureol-3 of ELF waves at frequency above and below the proton gyrofrequency, in "Resultats du Project ARCAD 3 et des Programmes Recents en Physique de la Magnetosphere et de l'Ionosphere, Toulouse 84" Cepadues Ed., 499-507, 1985.
75. Hayakawa, M., K. Ohta, and Y. Tanaka, Further direction finding evidence on ducted propagation of low-latitude daytime whistlers, *Res. Lett. Atmos. Electr.*, vol. 5, 35-46, 1985.
76. Hayakawa, M., T. Okada, and Y. Tanaka, Morphological characteristics and the polarization of plasmaspheric ELF hiss observed at Moshiri (L~1.6), *J. Geophys. Res.*, vol. 90, 5133-5140, 1985.
77. Hayakawa, M., T. Okada, and Y. Tanaka, Day-night and latitudinal variations of whistler intensities as estimated by direction finding measurements, *Nonlinear and Environmental Electromagnetics*, Ed. H. Kikuchi, Elsevier, 43-52, 1985.
78. Sazhin, S. S., M. Hayakawa, and Y. Tanaka, On the fine structure of the ground-based VLF chorus as an indicator of the wave-particle interactions in the magnetosphere, *Planet. Space Sci.*, vol. 33, 385-386, 1985.
79. Hayakawa, M., K. Ohta, T. Okada, and Y. Tanaka, Absolute intensities of low-latitude whistlers as deduced from the direction finding measurement, *Radio Sci.*, vol. 4, 985-988, 1985.
80. Hayakawa, M., Y. Tanaka, S. S. Sazhin, and T. Okada, An interpretation of dawnside mid-latitude VLF emissions in terms of quasi-linear electron cyclotron instability, *Nonlinear and Environmental Electromagnetics*, Ed. H. Kikuchi, Elsevier, 33-42, 1985.

81. Tanaka, Y., M. Hayakawa, D. Lagoutte, and F. Lefeuvre, Study of the middle latitude broadening of the spectrum of the waves emitted from ground, in "Resultats du Project ARCAD 3 et des Programmes Recents en Physique de la Magnetosphere et de l'Ionosphere, Toulouse 84", Cepadues Ed., 621-626, 1985.
82. Hayakawa, M., T. Okada, Y. Tanaka, K. Ohta, and S. Shimakura, Two-stationed field-analysis direction finding for magnetospheric VLF waves, *Solar Terr. Environmental Res. Japan*, vol. 9, 14--15, 1985.
83. Iwai, A., Y. Kato, M. Nishino, T. Okada, M. Hayakawa, and Y. Tanaka, Ground-based reception of the whistler mode DECCA signals, *Proc.Res.Inst.Atmospherics, Nagoya Univ.*, vol. 32, 29-44, 1985.
84. 岡田敏美, 早川正士, 田中義人, 岩井 章, 近距離レンジにおける VLF 方向探知の偏波誤差について, *電子通信学会論文誌*, vol. 69-B, 535-540, 1986.
85. Ohmi, N. and M. Hayakawa, On the generation of quasi-electrostatic half-gyrofrequency whistler mode waves in the magnetospheric plasma, *J. Plasma Phys.*, vol. 35, 351-373, 1986.
86. Ohmi, N. and M. Hayakawa, On the propagation of half-gyrofrequency whistler-mode waves in the magnetospheric plasma, *J. Plasma Phys.*, vol. 36, 379-385, 1986.
87. Ohmi, N., J. Ohtsu, and M. Hayakawa, On the polarization of half-gyrofrequency whistler-mode waves in the magnetospheric two-component plasma, *J. Phys. Soc. Japan*, vol. 55, 2915-2918, 1986.
88. Hayakawa, M., M. Parrot, and F. Lefeuvre, The wave normals of ELF hiss emissions observed onboard GEOS-1 at the equatorial and off-equatorial regions of the plasmasphere, *J. Geophys. Res.*, vol. 91, 7989--7999, 1986.
89. Hayakawa, M., N. Ohmi, M. Parrot, and F. Lefeuvre, Direction finding of ELF hiss emissions in a detached plasma region of the magnetosphere, *J. Geophys. Res.*, vol. 91, 135-141, 1986.
90. Hayakawa, M., Y. Tanaka, K. Ohta, and T. Okada, Absolute intensity of daytime whistlers at low and middle latitudes and its latitudinal variation, *J. Geophys.*, vol. 59, 67-72, 1986.
91. Hayakawa, M., Y. Tanaka, S. Shimakura, and A. Iizuka, Statistical characteristics of medium-latitude VLF emissions (unstructured and structured) : Local time dependence and the association with geomagnetic disturbances, *Planet. Space Sci.*, vol. 34, 1361-1372, 1986.
92. Ohta, K., H. Eguchi, M. Hayakawa, and Y. Tanaka, An automatic measurement of the polarization of magnetospheric whistlers, *Trans. Inst. Electr. Comm. Engrs. Japan*, vol. E69, 515--517, 1986.
93. Shimakura, S., T. Okada, M. Hayakawa, and Y. Tanaka, The relationship between the polarization of whistlers and their dispersion, *J. Geophys.*, vol. 59, 140-141, 1986.
94. Hayakawa, M., Y. Tanaka, S. S. Sazhin, T. Okada, and K. Kurita, Characteristics of dawnside mid-latitude VLF emissions associated with substorms as deduced from the two-stationed direction finding measurement, *Planet. Space Sci.*, vol. 34, 225-243, 1986.
95. Hayakawa, M., The generation mechanism of ELF hiss in detached plasma regions of the magnetosphere, as based on the direction finding results, *Memoirs Nat'l Inst. Polar Res.*, Special Issue 47, 173-182, 1987.

96. Muto, H. and M. Hayakawa, Ray-tracing study of the propagation in the magnetosphere of whistler-mode VLF emissions with frequency above one half the gyrofrequency, *Planet. Space Sci.*, vol. 35, 1397-1404, 1987.
97. Hayakawa, M., M. Parrot, and F. Lefeuvre, The wave distribution functions of plasmaspheric ELF hiss: GEOS 1 observation in the equatorial region, *Mem. Nat'l Inst. Polar Res.*, Special Issue 47, 157-172, 1987.
98. Shimakura, S., A. Tsubaki, and M. Hayakawa, Very unusual low latitude whistlers with additional traces of the earth-ionosphere waveguide propagation effect, *J. Atmos. Terr. Phys.*, vol. 49, 1081-1091, 1987.
99. Tanaka, Y., M. Nishino, and M. Hayakawa, Conjugate measurements of VLF transmitter signals at middle latitudes ($L=1.93$), *Planet. Space Sci.*, vol. 35, 1053-1059, 1987.
100. Muto, H., M. Hayakawa, M. Parrot, and F. Lefeuvre, Direction finding of half-gyrofrequency VLF emissions in the off-equatorial region of the magnetosphere and their generation and propagation, *J. Geophys. Res.*, vol. 92, 7538-7550, 1987.
101. Tanaka, Y., D. Lagoutte, M. Hayakawa, and F. Lefeuvre, Spectral broadening of VLF transmitter signals and sideband structure observed on Aureol-3 satellite at middle latitudes, *J. Geophys. Res.*, vol. 92, 7551-7559, 1987.
102. 太田健次, 早川正士, 江口博之, 低緯度で地上観測された Banded whistlers について, *Res. Lett. Atmos. Electr.*, vol. 8, 127-136, 1988.
103. 辻 伸治, 島倉 信, 岡田敏美, 早川正士, 磁気圏 VLF 波動の各種方位測定方式の比較検討 (SN 比の効果), *電子情報通信学会論文誌*, vol. J71-B, 1619-1630, 1988.
104. Hayakawa, M., Direction finding of half-gyrofrequency VLF emissions in the off-equatorial region of the magnetosphere, *Proc. NIPR Symp. on Upper Atmos. Phys*, No. 1, 168-172, 1988
105. Hayakawa, M., Observation and interpretation of substorm-associated VLF emission with frequency drift, *Res. Lett. Atmos. Electr.*, vol. 8, 109-116, 1988.
106. Zhou, H. B., J. S. Xu, and M. Hayakawa, On the longitudinal effect in whistler propagation characteristics at lower latitudes, *Planet. Space Sci.*, vol. 36, 833-839, 1988.
107. Shimakura, S., H. Saito, M. Hayakawa, and K. Ohta, A consideration on the ionospheric transmission mechanism of low-latitude whistlers, *Res. Lett. Atmos. Electr.*, vol. 8, 117-125, 1988.
108. Hayakawa, M., Y. Tanaka, S. S. Sazhin, M. Tixier, and T. Okada, Substorm-associated VLF emissions with frequency drift observed in the premidnight sector, *J. Geophys. Res.*, vol. 93, 5685-5700, 1988.
109. Hayakawa, M., K. Ohta, S. Shimakura, J. S. Xu, Z. T. Bao, and B. X. Liang, A proposal for multi-stationed direction finding measurements of low- and equatorial-latitude whistlers in China, *Res. Lett. Atmos. Electr.*, vol. 8, 31-35, 1988.
110. 太田健次, 早川正士, 江口博之, 低緯度ホイ斯拉のスペクトルにおけるパッチ構造とその解釈, *電子情報通信学会論文誌*, vol. J72-B, 351-358, 1989.
111. 太田健次, 早川正士, 馬場清英, 江口博之, 低緯度ホイスラーにおける到来方向の周波数依存性, *Res. Lett. Atmos. Electr.*, vol. 9, 43-52, 1989.

112. Hayakawa, M., Further study of the frequency drift of dawnside mid-latitude VLF emissions associated with substorms, *Planet. Space Sci.*, vol. 37, 269-281, 1989.
113. Hayakawa, M., Characteristics of substorm-associated VLF/ELF emissions at medium latitudes, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 2, 47-61, 1989
114. Hayakawa, M., Satellite observation of low-latitude VLF radio noises and their association with thunderstorms, *J. Geomagn. Geoelectr.*, vol. 41, 573-595, 1989.
115. Hayakawa, M., Radio noise, theory and experiment, *Proc. Int'l College on Theoretical & Experimental Radiopropagation Physics*, Trieste, Italy, 1989.
116. Hattori, K. and M. Hayakawa, A study of the periodicity in occurrence of natural magnetospheric chorus emissions, *Res. Lett. Atmos. Electr.*, vol. 9, 109-115, 1989.
117. Ohta, K., M. Hayakawa, and S. Shimakura, Frequency dependence of arrival direction and polarization of low latitude whistlers and their ducted propagation, *J. Geophys. Res.*, vol. 94, 6975-6978, 1989.
118. Tsuji, S., M. Hayakawa, S. Shimakura, and K. Hattori, On the statistical properties of magnetospheric ELF/VLF hiss, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 2, 74-83, 1989.
119. Hayakawa, M., H. Muto, S. Shimakura, K. Hattori, M. Parrot, and F. Lefevre, The wave normal direction of chorus emissions in the outer magnetosphere, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 2, 62-73, 1989.
120. Xu, J. S., M. Tian, C. C. Tang, M. Hayakawa, K. Ohta, and S. Shimakura, Direction finding of nighttime whistlers at very low latitudes in China : Preliminary results, *Planet. Space Sci.*, vol. 37, 1047-1052, 1989.
121. Hattori, K., M. Hayakawa, S. Shimakura, M. Parrot, and F. Lefevre, GEOS-1 observation of hiss-triggered chorus emissions in the outer magnetosphere and their generation model, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 2, 84-95, 1989.
122. 太田健次, 友松通, 早川正士, ホイスラーの電離下降透過点と先行空電の到来方位測定, *Res. Lett. Atmos. Electr.*, vol. 10, 89-101, 1990.
123. 太田健次, 早川正士, 島倉信, 江口博之, 中国超低緯度における夜間ホイスラーの多点同時観測による到来方位測定, *電子情報通信学会論文誌*, vol. J73-B, 182-189, 1990.
124. Hayakawa, M., Commission E: Electromagnetic noise and interference, *Japanese Comm. for Radio Science, Report 1987-1990 to XIIIrd General Assembly*, URSI, Prague, Czechoslovakia, 57-65, 1990.
125. Hayakawa, M., The enhancement factor of medium-latitude whistler ducts as deduced from the previous results of the earth-ionosphere waveguide propagation of whistlers after their ionospheric transmission, *Res. Lett. Atmos. Electr.*, vol. 10, 25-29, 1990.
126. Hayakawa, M., Satellite observation of lightnings and its significance in magnetospheric physics, *Proc. URSI Comm. E Open Symposium*, 1990.
127. Ohta, K. and M. Hayakawa, The correlation of whistler occurrence rate at a low latitude with thunderstorm activity at its conjugate region and with solar activity, *Pure & Appl. Geophys.*, vol. 133, 167-178, 1990.

128. Hattori, K., K. Ishikawa, and M. Hayakawa, Ray-tracing interpretation of wave normal directions of chorus emissions observed in the off-equatorial region of the outer magnetosphere, Proc. NIPR Symp. on Upper Atmos. Phys., vol. 3, 70-78, 1990.
129. Hayakawa, M., F. Lefeuvre, and M. Parrot, On the system of Aureol-3 satellite direction finding for ionospheric and magnetospheric ELF waves, Trans. Inst. Electr. Inform. Comm. Engrs. Japan, vol. E73, 942-951, 1990.
130. Hayakawa, M., K. Ohta, and S. Shimakura, Spaced direction finding of very low latitude whistlers and their propagation mechanism, J. Geophys. Res., vol. 95, 15091-15102, 1990.
131. Ishikawa, K., K. Hattori, and M. Hayakawa, A study of ray focusing of whistler-mode waves in the magnetosphere, Trans. Inst. Electr. Inform. Comm. Engrs. Japan, vol. E73, 149-154, 1990.
132. Hayakawa, M., S. Shimakura, M. Parrot, F. Lefeuvre, and K. Hattori, Direction finding of chorus emissions in the outer magnetosphere and their generation and propagation, Planet. Space Sci., vol. 38, 135-143, 1990.
133. 太田健次, 早川正士, 島倉信, 友松通, 低緯度におけるホイ斯拉の発生頻度とその反対半球における雷活動, 電子情報通信学会論文誌, vol. J74-B-II, 276-284, 1991.
134. 馬場清英, 太田健次, 友松通, 早川正士, トウイーク空電の波動特性の周波数依存性, 電子情報通信学会論文誌, vol. J74-B-II, 587-593, 1991.
135. Hayakawa, M., Whistler-triggered VLF emissions observed in the electron slot and inner radiation belt, as observed at Moshiri(L \sim 1.6), Proc. NIPR Symp. on Upper Atmos. Phys., vol. 4, 9-19, 1991.
136. Hayakawa, M., Observation at Moshiri (L=1.6) of whistler-triggered VLF emissions in the electron slot and inner radiation belt regions, J. Geomagn. Geoelectr., vol. 43, 267-276, 1991.
137. Hayakawa, M., Direction finding of magnetospheric VLF/ELF emissions, Environmental & Space Electromagnetics, Ed. H. Kikuchi, 155-167, Springer Verlag, 1991.
138. Shimakura, S. and M. Hayakawa, On the estimation of the ionospheric exit regions of magnetospheric VLF radio waves by the use of wave energy distribution in wave number space, Environmental & Space Electromagnetics, Ed. H. Kikuchi, 299-309, Springer Verlag, 1991.
139. Hattori, K., K. Ishikawa, and M. Hayakawa, Ray-tracing study of the plasmopause effect on nonducted whistler-mode wave propagation, Planet. Space Sci., vol. 39, 425-432, 1991.
140. Hayakawa, M., K. Ohta, and S. Shimakura, Direction finding of very low latitude whistlers and their propagation, Environmental & Space Electromagnetics, Ed. H. Kikuchi, 168-171, Springer Verlag, 1991.
141. Ishikawa, K., K. Hattori, and M. Hayakawa, Ray focusing of whistler-mode waves in a magnetoplasma, Environmental & Space Electromagnetics, Ed. H. Kikuchi, 222-226, Springer Verlag, 1991.

142. Ohta, K., M. Hayakawa, and S. Shimakura, Frequency dependence of ionospheric exit points and polarization of daytime whistlers and low latitude, *Environmental & Space Electromagnetics*, Ed. H. Kikuchi, 172-178, Springer Verlag, 1991.
143. Shimakura, S., M. Moriizumi, and M. Hayakawa, Propagation mechanism of very unusual low-latitude whistlers with additional traces of the earth-ionosphere waveguide propagation effect, *Planet. Space Sci.*, vol.39, 611-616, 1991.
144. Shimakura, S., T. Yamamoto, and M. Hayakawa, On the short and long periodicities in whistler occurrence rate and their implication, *Res. Lett. Atmos. Electr.*, vol. 11, 23-36, 1991.
145. Hayakawa, M., S. Shimakura, M. Moriizumi, and K. Ohta, On the location of causative atmospherics of very low latitude whistlers and their magnetospheric propagation mechanism, *Radio Sci.*, vol. 27, 335-339, 1991.
146. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, An experimental study of the role of hiss in triggering chorus in the outer magnetosphere, as based on spectral analyses and direction finding measurement on board GEOS, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 4, 20-41, 1991.
147. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, Further evidence of triggering chorus emissions from wavelets in the hiss band, *Planet. Space Sci.*, vol. 39, 1465-1473, 1991.
148. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, Further evidence of triggering chorus from wavelets in the hiss band, *Proc. 2nd Week Symp., 4th Intl School for Space Simulation*, 147-150, 1991.
149. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, On the experimental results of hiss-triggered chorus observed onboard GEOS-1 satellite in the outer magnetosphere, *Environmental & Space Electromagnetics*, Ed. H. Kikuchi, 258-275, Springer Verlag, 1991.
150. 服部 克巳, 早川 正士, 磁気圏V L F コーラスの方位測定とその発生・伝搬機構, *電子情報通信学会論文誌*, vol. J75-B-II, 217-228, 1992.
151. 太田 健次, 友松 通, 高橋 修, 早川 正士, レイトレーシングによる超低緯度ホイストラの伝搬特性, *電子情報通信学会論文誌*, vol. J75-B-II, 309-314, 1992.
152. Hayakawa, M. and S. S. Sazhin, Mid-latitude and plasmaspheric hiss: A review, *Planet. Space Sci.*, vol. 40, 1325-1338, 1992.
153. Hayakawa, M. and K. Ohta, On the L-dependence of whistler triggered emissions as based on the measurement at Ceduna, Australia (L=1.93), *Planet. Space Sci.*, vol. 40, 1193-1195, 1992.
154. Hayakawa, M. and K. Ohta, The propagation of low-latitude whistlers : A review, *Planet. Space Sci.*, vol. 40, 1339-1351, 1992.
155. Ohta, K. and M. Hayakawa, The automatic measurement of direction finding of whistlers, *Geomagn. & Aeronomy*, vol. 32, 34-47, 1992 (in Russian).
156. Sazhin, S. S., and M. Hayakawa, Magnetospheric chorus emissions: A review, *Planet. Space Sci.*, vol. 40, 681-697, 1992.

157. Shimakura, S. and M. Hayakawa, Wave distribution functions of magnetospheric VLF waves with multiple field components: The effect of the polarization model in the integration kernels on the reconstruction of wave distribution functions, *Inst. Electr. Inform. Comm. Engrs. Japan, Trans. Fundamentals*, vol. E75-A, 1014-1019, 1992.
158. Hayakawa, M., K. Ohta, and S. Shimakura, Direction finding techniques for magnetospheric VLF waves: Recent achievements, *Trends Geophys. Res.*, vol. 1, 157-164, 1992.
159. Hayakawa, M., T. Yoshino, and V. A. Morgounov, Low-latitude magnetospheric whistlers and earthquakes, *Res. Lett. Atmos. Electr.*, Special Issue on Atmospheric Electricity Phenomena Associated with Earthquakes and Volcanic Eruptions. Ed. by M. Hayakawa and T. Ogawa, vol. 12, No. 3, 253-273, 1992.
160. Sazhin, S. S., M. Hayakawa, and K. Bullough, Whistler diagnostics of magnetospheric parameters: A review, *Ann. Geophysicae*, vol. 10, 293-308, 1992.
161. Shimakura, S., K. Ohta, and M. Hayakawa, Wave distribution functions of magnetospheric whistlers at low latitudes, *Res. Lett. Atmos. Electr.*, vol. 12, 161-166, 1992.
162. Sukhorukov, A. I., S. Shimakura, and M. Hayakawa, On the additional dispersion of a whistler in the earth-ionosphere waveguide, *Planet. Space Sci.*, vol. 40, 1185-1191, 1992.
163. Sukhorukov, A. I., S. Shimakura, and M. Hayakawa, Approximate solution for the eigenvalues near cut-off frequencies in the nocturnal inhomogeneous earth-ionosphere waveguide, *Planet. Space Sci.*, vol. 40, 1363-1369, 1992.
164. Hayakawa, M., S. Shimakura, T. Kobayashi, and N. Sato, A study of polarization of irregular pulsations of diminishing period and their generation mechanism, *Planet. Space Sci.*, vol. 40, 1081-1091, 1992.
165. Hayakawa, M., S. Shimakura, Y. Kobayashi, and N. Sato, Statistical characteristics of the polarization of Pc1 micropulsations at high latitudes, *Planet. Space Sci.*, vol. 40, 1353-1362, 1992.
166. Hayakawa, M., S. Shimakura, M. Moriizumi, and K. Ohta, On the location of causative atmospherics of very low latitude whistlers and their magnetospheric propagation mechanism, *Radio Sci.*, vol. 27, 335-339, 1992.
167. Shimakura, S., M. Hayakawa, F. Lefeuvre, and D. Lagoutte, On the estimation of wave energy distribution of magnetospheric VLF waves at the ionospheric base with ground-based multiple electromagnetic field components, *J. Geomagn. Geoelectr.*, vol. 44, 573-590, 1992.
168. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, Further experimental study of the role of wavelets in the hiss band for triggering chorus emissions, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 5, 70-76, 1992.
169. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, Further evidence of triggering chorus emissions from wavelets in the hiss band, *Planet. Space Sci.*, vol. 39, 1465-1472, 1992.

170. Hayakawa, M., I. Tomizawa, K. Ohta, S. Shimakura, Y. Fujinawa, K. Takahashi, and T. Yoshino, Direction finding of precursory radio emissions associated with earthquakes: A proposal, *Res. Lett. Atmos. Electr., Special Issue on Atmospheric Electricity Phenomena Associated with Earthquakes and Volcanic Eruptions*, Ed. by M. Hayakawa and T. Ogawa, vol. 12, No. 3, 211-224, 1992.
171. 馬場清英, 早川正士, 有限要素法による超長波電波の地球、電離層導波管内伝搬の解析, *電子情報通信学会論文誌*, vol. J76-B-II, 236-244, 1993.
172. 馬場清英, 太田健次, 早川正士, 異方性不均質電離層下でのトウイ-ク空電の伝搬特性, *電子情報通信学会論文誌*, vol. J76-B-II, 11-19, 1993.
173. 山口勝, 服部克巳, 岩間尚文, 島倉信, 早川正士, 磁気圏 VLF/ELF 電磁波動分布関数の線形再構成による新地上方位測定法, *電子情報通信学会論文誌*, vol. J76-B-II, 880-889, 1993.
174. Hayakawa, M., Ground-based direction finding of magnetospheric plasma waves and its applications, *Inst. Electr. Inform. Comm. Engrs. Japan*, vol. 76, 258-264 (Technical Survey), 1993.
175. Hayakawa, M., VLF/ELF radio noise in the inner plasmasphere, *Trends Geophys. Res.*, vol. 2, 211-231, 1993.
176. Hayakawa, M., Ionospheric and magnetospheric VLF/ELF radio noises at lower latitudes, *J. Atmos. Electr.*, vol. 13, 65-93, 1993.
177. Hayakawa, M., Study of generation mechanisms of magnetospheric VLF/ELF emissions based on the direction findings, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 6, 117-133, 1993.
178. Hayakawa, M. and E. K. Smith, Terrestrial and planetary EM noise, *Rev. Radio Sci. 1990-1992*, Ed. by W. Ross Stone, Oxford Univ. Press, 293-306, 1993.
179. Trakhtengerts, V. Y. and M. Hayakawa, A wave-wave interaction in whistler frequency range in space plasma, *J. Geophys. Res.*, vol. 98 19205-19217, 1993.
180. Hayakawa, M., T. Yoshino, and V. A. Morgounov, On the possible influence of seismic activity on the propagation of magnetospheric whistlers at low latitudes, *Phys. Earth Planet. Inter.*, vol. 77, 97-108, 1993.
181. Sazhin, S. S., K. Bullough, and M. Hayakawa, Auroral hiss: A review, *Planet. Space Sci.*, vol. 41, 153-166, 1993.
182. Takahashi, O., K. Ohta, and M. Hayakawa, On the structure of ducts for mid-latitude whistlers and their ionospheric transmission and deduced from the ground-based direction finding, *Pageoph.*, vol. 140, 519-535, 1993.
183. Molchanov, O. A., O. A. Mazhaeva, A. N. Goliavin, and M. Hayakawa, Observations by the intercosmos-24 satellite of ELF-VLF electromagnetic emissions associated with earthquakes, *Ann. Geophysicae*, vol. 11, 431-440, 1993.
184. Nagai, K., K. Ohta Y. Hobara, and M. Hayakawa, Transmission characteristics of VLF/ELF radio waves through the Jovian ionospheres, *Geophys. Res. Lett.*, vol. 20, 2435-2438, 1993.

185. Hattori, K., M. Yamaguchi, N. Iwama, and M. Hayakawa, GCV-aided linear image regularization for the reconstruction of magnetospheric VLF/ELF waves, in "Computer Analysis of Images and Patterns", Ed. by D. Chetverikov and W. C. Kropatsch, 788-791, Springer-Verlag, 1993.
186. Ohnami, S., M. Hayakawa, T. F. Bell, and T. Ondoh, Nonlinear wave-wave interactions in the subauroral ionosphere on the basis of ISIS-2 satellite observations of Siple station VLF signals, *Geophys. Res. Lett.*, vol. 20, 739-742, 1993.
187. Hayakawa, M., I. Tomizawa, K. Ohta, Y. Fujinawa, and K. Takahashi, Direction finding of precursory radio emissions associated with earthquakes: A proposal, *Phys. Earth Planet. Inter.*, vol. 77, 127-135, 1993.
188. Hayakawa, M., Y. Fujinawa, F. F. Evison, V. A. Shapiro, P. Varotsos, A. C. Fraser-Smith, O. A. Molchanov, O. A. Pokhotelov, Y. Enomoto, and H. H. Schloessin, What is the future direction of investigation on electromagnetic phenomena related to earthquake prediction, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 667-677, 1994.
189. 太田健次, 清水明雄, 早川正士, 島倉信, 導波管伝搬効果を伴う超低緯度ホイストラ, *電子情報通信学会論文誌*, vol. J77-B-II, 437-444, 1994.
190. Hayakawa, M., Direction finding of seismogenic emissions, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 493-494, 1994.
191. Baba, K. and M. Hayakawa, The effect of localized ionospheric perturbations on subionospheric VLF propagation on the basis of finite element method, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 399-407, 1994.
192. Hayakawa, M. and H. Sato, Ionospheric perturbations associated with earthquakes, as detected by subionospheric VLF propagation, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 391-397, 1994.
193. Hattori, K. and M. Hayakawa, Consideration of dynamic spectra and direction finding results of hiss-triggered chorus emissions, *Proc. NIPR Symp. on Upper Atmos. Phys.*, vol. 7, 40-52, 1994.
194. Molchanov O. A. and M. Hayakawa, Generation of ULF seismogenic electromagnetic emission: A natural consequence of microfracturing process, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 537-563, 1994.
195. Omid, M. and M. Hayakawa, Excitation of electromagnetic wave by delta function current sheets in the ionospheric plasma, *Radio Sci.*, vol. 29, 867-877, 1994.
196. Sazhin, S. S. and M. Hayakawa, Review paper: periodic and quasiperiodic VLF emissions, *J. Atmos. Terr. Phys.*, vol. 56, 735-753, 1994.
197. Hayakawa, M., K. Ohta, and K. Baba, Wave characteristics of tweek atmospherics deduced from the direction finding measurement and theoretical interpretations, *J. Geophys. Res.*, vol. 99, 10733-10743, 1994.

198. Hayakawa, M., T. Yoshino, and V. A. Morgounov, On the seismic effects on magnetospheric whistlers at low latitudes, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 429-438, 1994.
199. Molchanov, O. A., M. Hayakawa, and V. A. Rafalsky, Penetration of electromagnetic emissions from an underground seismic source into the atmosphere, ionosphere and magnetosphere, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 565-606, 1994.
200. Ohta, K., A. Shimizu, and M. Hayakawa, The effect of subionospheric propagation on whistlers as deduced from direction finding measurements, *Geophys. Res. Lett.*, vol. 21, 89-92, 1994.
201. Nickolaenko, A. P., V. A. Rafalsky, A. V. Shvets, and M. Hayakawa, A time domain direction finding technique for location of wideband ELF-VLF atmospherics, *J. Atmos. Electr.*, vol.14, 97-107, 1994.
202. Molchanov, O. A., O. A. Mazhaeva, A. N. Goliavin, and M. Hayakawa, Observation by the intercosmos-24 satellite of ELF-VLF electromagnetic emissions associated with earthquakes, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 373, 1994.
203. Yamaguchi, M., K. Hattori, N. Iwama, and M. Hayakawa, A new direction finding method of magnetospheric VLF/ELF radio waves using the linear regularization and generalized cross validation, *Dusty and Dirty Plasmas, Noise, and Chaos in Space and in the Laboratory*, Ed. by H. Kikuchi, 405-414, Plenum Press, 1994.
204. Hattori, K., M. Hayakawa, D. Lagoutte, M. Parrot, and F. Lefeuvre, The experimental results of triggering chorus emissions from monochromatic wave components in the hiss and in the outer magnetosphere, *Dusty and Dirty Plasmas, Noise, and Chaos in Space and in the Laboratory*, Ed. by H. Kikuchi, 395-404, Plenum Press, 1994.
205. Molchanov, O. A., A. P. Nickolaenko, V. A. Rafalsky, A. Yu. Schecotov, and M. Hayakawa, Influence of layer structure of the lower ionosphere on nonmonotonic spectrum behavior of ELF atmospheric noise, *Geophys. Res. Lett.*, vol. 21, 2467-2370, 1994.
206. Tomizawa, I., M. Hayakawa, T. Yoshino, K. Ohta, T. Okada, and H. Sakai, Observation of ELF/VLF electromagnetic variations associated with a seismic experimental explosion, *Electromagnetic Phenomena Related to Earthquake Prediction*, Ed. by M. Hayakawa and Y. Fujinawa, TERRAPUB, 337-347, 1994.
207. 早川 正士, 地震の前兆を伝える超低周波の電磁波 (特集地震予知), *化学*, vol. 50, No. 9, 543-545, 1995.
208. Hayakawa, M., Association of whistlers with lightning discharges on the Earth and on Jupiter, *J. Atmos. Terr. Phys.*, vol. 57, 525-535, 1995.
209. Baba, K., and M. Hayakawa, The effect of localized ionospheric perturbations on subionospheric VLF propagation on the basis of finite element method, *Radio Sci.*, vol. 30, 1511-1517, 1995.
210. Hirari, M. and M. Hayakawa, Simulation study on ground-based direction finding of VLF/ELF radio waves by wave distribution functions: a Bayesian approach, *IEICE Trans. Commun.*, vol. E78-B, 923-931, 1995.

211. Hayakawa, M., K. Ohta, and S. Shimakura, Recent findings on the propagation of low latitude whistlers, *J. Atmos. Terr. Phys.*, vol. 57, 485-492, 1995.
212. Molchanov, O. A., M. Hayakawa, and V. A. Rafalsky, Penetration characteristics of electromagnetic emissions from an underground seismic source into the atmosphere, ionosphere, and magnetosphere, *J. Geophys. Res.*, vol. 100, 1691-1712, 1995.
213. Hayakawa, M., K. Ohta, S. Shimakura, and K. Baba, Recent findings on VLF/ELF sferics, *J. Atmos. Terr. Phys.*, vol. 57, 467-477, 1995.
214. Rafalsky, V. A., A. V. Shvets, and M. Hayakawa, One-site distance-finding technique for locating lightning discharges, *J. Atmos. Terr. Phys.*, vol.58, 1255-1261, 1995.
215. Rafalsky, V. A., A. P. Nickolaenko, A. V. Shvets, and M. Hayakawa, Location of lightning discharges from a single station, *J. Geophys. Res.*, vol. 100, 20829-20838, 1995.
216. Iwama, N., M. Yamaguchi, K. Hattori, and M. Hayakawa, GCV-aided linear reconstruction of the wave distribution function for the ground-based direction finding of magnetospheric VLF/ELF waves, *J. Electromagnetic Waves Appl.*, vol. 9, 757-782, 1995.
217. Molchanov, O. A., O. A. Maltseva, M. Hayakawa, and Y. Hobara, Method of modeling of VLF wave propagation in the earth's magnetosphere and upper ionosphere, *Radio Sci.*, vol. 30, 1597-1611, 1995.
218. Hobara, Y., O. A. Molchanov, M. Hayakawa, and K. Ohta, Propagation characteristics of whistler waves in the Jovian ionosphere and magnetosphere, *J. Geophys. Res.*, vol. 100, 23523-23531, 1995.
219. Nickolaenko, A. P. and M. Hayakawa, Heating of the lower ionosphere electrons by electromagnetic radiation of lightning discharges, *Geophys. Res. Lett.*, vol. 22, 3015-3018, 1995.
220. Hayakawa, M., Whistlers, Chapt.7, in "Handbook of Atmospheric Electrodynamics", Ed. by H. Volland, vol.II, CRC Press, 155-193, 1995.
221. Molchanov, O. A., and M. Hayakawa, Generation of ULF electromagnetic emissions by microfracturing, *Geophys. Res. Lett.*, vol. 22, 3091-3094, 1995.
222. Hayakawa, M., VLF 電離層・大地導波管伝搬電波を用いた地震予知法(新方式の提案), *J. Atmos. Electr.*, vol. 16, 19-28, 1996.
223. Hirari, M. and M. Hayakawa, A Bayesian regularization approach to ill-posed problems with application to the direction finding of VLF/ELF radio waves, *IEICE Trans. Commun.*, vol. E79-B, 63-69, 1996.
224. Hayakawa, M., R. Kawate, O. A. Molchanov, and K. Yumoto, Results of ultra-low-frequency magnetic field measurements during the Guam earthquake of 8 August 1993, *Geophys. Res. Lett.*, vol. 23, 241-244, 1996.
225. Baba, K. and M. Hayakawa, Computational results of the effect of localized ionospheric perturbations on subionospheric VLF propagation, *J. Geophys. Res.*, vol. 101, 10985-10993, 1996.
226. 馬場清英, 早川正士, 下部電離層の局所的な擾乱による VLF 電波の散乱の有限要素法による解析, *電子情報通信学会論文誌*, vol. J79-B-II, 309-317, 1996.

227. Nickolaenko, A. P., M. Hayakawa, and Y. Hobara, Temporal variations of the global lightning activity deduced from the Schumann resonance data, *J. Atmos. Terr. Phys.*, vol. 58, 1699-1709, 1996.
228. Hayakawa, M., O. A. Molchanov, T. Ondoh, and E. Kawai, The precursory signature effect of the Kobe earthquake on VLF subionospheric signals, *J. Comm. Res. Lab., Tokyo*, vol. 43, 169-180, 1996.
229. Hayakawa, M., O. A. Molchanov, T. Ondoh, and E. Kawai, Anomalies in the sub-ionospheric VLF signals for the 1995 Hyogo-ken Nanbu earthquake, *J. Phys. Earth*, vol. 44, 413-418, 1996.
230. 嶋 直樹, 太田健次, 北川智美, 芳原容英, 永井由佳, 早川正士, ホイスラの方位測定とノーズ・イクステンション法による中緯度ホイスラダクト特性, *電子情報通信学会論文誌*, vol.J79-B, 549-556, 1996.
231. Hirari, M. and M. Hayakawa, A neural network for the DOA of VLF/ELF radio waves, *IEICE Trans. Commun.*, vol. E79-B, 1598-1605, 1996.
232. Ohta, K., T. Kitagawa, N. Shima, M. Hayakawa, and R. L. Dowden, Characteristics of mid-latitude whistler ducts as deduced from ground-based measurements, *Geophys. Res. Lett.*, vol. 23, 3301-3304, 1996.
233. Omid, M. and M. Hayakawa, Propagation of transient electromagnetic waves in a lossy magnetoplasma half-space with arbitrarily-oriented magnetic field, *J. Atmos. Electr.*, vol.16, 89-101, 1996.
234. Hayakawa, M., R. Kawate, and O. A. Molchanov, Ultra-low-frequency signatures of the Guam earthquake on 8 August 1993 and their implication, *J. Atmos. Electr.*, vol. 16, 193-198, 1996.
235. Hayakawa, M., O. A. Molchanov, T. Ondoh, and E. Kawai, Precursory signature of the Kobe earthquake on VLF subionospheric signal, *J. Atmos. Electr.*, vol. 16, 247-257, 1996.
236. Galperin, Yu. I. and M. Hayakawa, On the magnetospheric effects of experimental ground explosions observed from AUREOL-3, *J. Geomagn. Geoelectr.*, vol. 48, 1241-1263, 1996.
237. 早川正士, 『雷雲と電離層との結合』の研究の重要性, *天気(日本気象学会)*, vol. 43, 760-762, 1996.
238. Hobara, Y. and M. Hayakawa, Ducted propagation of lightning-generated whistlers in the Jovian magnetosphere, *J. Atmos. Electr.*, vol. 17, 33-45, 1997.
239. Molchanov, O. A., M. M. Mogilevsky, V. V. Afonin, Z. Klos, M. Hayakawa, and N. Shima, Nonlinear ELF/VLF effects observed on active satellite, Chapt.10, in "Nonlinear Waves and Chaos in Space Plasmas", Ed. by T. Hada and H. Matsumoto, Terra Sci. Pub. Co., Tokyo, 337-357, 1997.
240. Kikuchi, H., Z-I. Kawasaki, and M. Hayakawa, Terrestrial and planetary EM noise, *Rev. Radio Sci. 1993-1996*, Ed. by W. Ross Stone, Oxford Univ. Press, 397-418, 1997.
241. Hayakawa, M., Electromagnetic precursors of earthquakes: Review of recent activities, *Rev. Radio Sci. 1993-1996*, Ed. by W. Ross Stone, Oxford Univ. Press, 807-818, 1997.

242. Omid, M., M. Chiba, and M. Hayakawa, Evaluation of microstrip green function, *Electronics Lett.*, vol. 33, No. 6, 434-435, 1997.
243. Hobara, Y., S. Kanemaru, M. Hayakawa, and D. A. Gurnett, On estimating the amplitude of Jovian whistlers observed by Voyager 1 and implications concerning lightning, *J. Geophys. Res.*, vol. 102, 7115-7125, 1997.
244. Ohta, K., Y. Nishimura, T. Kitagawa, and M. Hayakawa, Study of propagation characteristics of very low latitude whistler by means of three-dimensional ray-tracing computations, *J. Geophys. Res.*, vol. 102, 7537-7546, 1997.
245. 太田健次, 西村安弘, 北川智美, 早川正士, 3次元レイトレーシングによる超低緯度ホイストラの伝搬特性, *電子情報通信学会論文誌*, vol. J80-B, 314-321, 1997.
246. Omid, M., Y. Kami, and M. Hayakawa, Analysis of field coupling to nonuniform transmission lines, *Trans. IEE of Japan*, vol. 117-A, 484-489, 1997.
247. Omid, M., Y. Kami, and M. Hayakawa, Crosstalk analysis of high-speed logic circuits, *IEICE Trans. Commun.*, vol. E80-B, 678-685, 1997.
248. Katagiri, S., K-I. Morita, N. Kawaguchi, and M. Hayakawa, An imaging algorithm using the bispectrum in radio interferometry, *Pub. Astron. Soc. Japan*, vol. 49, 123-129, 1997.
249. 徳重寛吾, 山中幸雄, 早川正士, 中波放送局周辺地域における電磁界強度予測法, *電子情報通信学会論文誌*, vol. J80-B-II, 524-532, 1997.
250. Omid, M., Y. Kami, and M. Hayakawa, Field coupling to nonuniform and uniform transmission lines, *IEEE Trans. Electromagn. Compatibility*, vol. 39, 201-211, 1997.
251. Shvets, A. V., A. P. Nickolaenko, and M. Hayakawa, Characteristics of nearby lightning discharges observed at Singapore, *J. Atmos. Solar-terr. Phys.*, vol. 59, 1717-1726, 1997.
252. Ohta, K., T. Kitagawa, M. Hayakawa, and R. L. Dowden, A new type of mid-latitude multi-path whistler trains including a non-ducted whistler, *Geophys. Res. Lett.*, vol. 24, 2937-2740, 1997.
253. 早川正士, VLF電波で地震予知は可能か?, *地震ジャーナル*, 24, 29-38, 1997.
254. 後藤薫, M. Hirari, 早川正士, ニューラルネットワークを用いた人工雑音源の方位測定法, *Trans. IEE of Japan*, vol. 118-C, 1998.
255. Nickolaenko, A. P., L. Rabinowicz, and M. Hayakawa, Analyses of the ULF/ELF records performed in a seismo-active region, *J. Atmos. Electr.*, vol. 18, 1-10, 1998.
256. Molchanov, O. A. and M. Hayakawa, On the generation mechanism of ULF seismogenic electromagnetic emissions, *Phys. Earth Planet. Inter.*, vol. 105, 201-210, 1998.
257. Kawate, R., O. A. Molchanov, and M. Hayakawa, Ultra-low-frequency magnetic fields during the Guam earthquake of 8 August 1993 and their interpretation, *Phys. Earth Planet. Inter.*, vol. 105, 239-248, 1998.
258. Molchanov, O. A., M. Hayakawa, T. Ondoh, and E. Kawai, Precursory effects in the subionospheric VLF signals for the Kobe earthquake, *Phys. Earth Planet. Inter.*, vol. 105, 239-248, 1998.

259. Omid, M., Y. Kami and M. Hayakawa, Time- and frequency-domain coupling analysis of field-to-nonuniform transmission lines, *Chinese J. Electronics*, vol. 7., 193-198, 1998.
260. Shvets, A. V. and M. Hayakawa, Polarization effects for tweek propagation, *J. Atmos. Solar-terr. Phys.*, vol. 60, 461-469, 1998.
261. Nickolaenko, A. P. and M. Hayakawa, Electric fields produced by lightning discharges, *J. Geophys. Res.*, vol. 103, no. D14, 17,175-17,189, 1998.
262. Molchanov, O. A. and M. Hayakawa, Subionospheric VLF signal perturbations possibly related to earthquakes, *J. Geophys. Res.*, vol. 103, 17,489-17,504, 1998.
263. Nickolaenko, A. P. and M. Hayakawa, Model electromagnetic pulses in the ELF range, *J. Atmos. Electr.*, vol. 18, 95-110, 1998.
264. 太田健次, 北川智美, 神崎浩史, 早川正士, and R. L. Dowden, 中緯度におけるダクト及びビノダクト伝搬のホイストラ, *J. Atmos. Electr.*, vol. 18, 131-138, 1998.
265. Nickolaenko, A. P. and M. Hayakawa, Natural electromagnetic pulses in the ELF range, *Geophys. Res. Lett.*, vol. 25, 3103-3106, 1998.
266. Koshevaya, S., E. Gutierrez-D., M. Hayakawa, M. Tecpoyotl-T., V. Grimalsky, and Y. Kishenko, Interaction of Powerful Electromagnetic Wave with Integrated P-I-N Structures, *Jpn. J. Appl. Phys.*, vol. 37, 4332-4333, 1998.
267. Koshevaya, S., M. Tecpoyotl, M. Hayakawa, V. Grimalsky, and Y. Kishenko, Dynamics of Charge Storage and Interaction of Microwaves with Silicon-Integrated Surface Oriented Structures, *Jpn. J. Appl. Phys.*, vol. 37, 4334-4335, 1998.
268. Hobara, Y., V. Y. Trakhtengerts, A. G. Demekhov, and M. Hayakawa, Cyclotron amplification of whistler waves by electron beams in an inhomogeneous magnetic field, *J. Geophys. Res.*, vol. 103, 20449-20458, 1998.
269. Molchanov, O. A., A. V. Shvets, and M. Hayakawa, Analysis of lightning - induced ionization from VLF Trimpis events, *J. Geophys. Res.*, vol. 103, 23443-23458, 1998.
270. Galperin, Yu. and M. Hayakawa, On a possibility of parametric amplifier in the stratosphere-mesosphere suggested by active MASSA experiments with the AUREOL-3 satellite, *Earth Planets Space*, vol. 50, 827-832, 1998.
271. Baba, K., D. Nunn, and M. Hayakawa, The modeling of VLF Trimpis using both finite element and 3D Born modeling, *Geophys. Res. Lett.*, vol. 25, no. 24, 4453-4456, 1998.
272. Nunn, D., K. Baba, and M. Hayakawa, VLF Trimpis modelling on the path NWC-Dunedin using both finite element and 3D Born modelling, *J. Atmos. Solar-terr. Phys.*, vol.60, 1497-1515, 1998.
273. Nickolaenko, A.P., and M. Hayakawa, Electric fields of model lightning strokes in the neutral atmosphere, *Izvestia, VUZov, Radiofizika*, vol. 41(7), 561-568, 1998 (in Russian).
274. 神崎 浩史, 牧田 和幸, 田中 明博, 太田 健次, 早川 正士, 緯度、経度方向の電離層の傾きを考慮したホイストラの3次元レイトレーシング, *電気学会論文誌C, Trans. IEE of Japan*, vol. 119-C, No. 1, 77-82, 1999.
275. Nickolaenko, A. P. and M. Hayakawa, A model for causative discharge of ELF-transients, *J. Atmos. Electr.*, vol. 19, no. 1, 11-24, 1999.

276. 嶋 直樹, 早川 正士, 整合フィルタの概念を用いたトリンピ・イベントの自動検出法, *J. Atmos. Electr.*, vol. 19, no. 1, 61-68, 1999.
277. 太田 健次, 嶋 直樹, 神崎 浩史, 牧田 和幸, 田中 明博, 早川 正士, 三次元トレーシングを用いた異なる低緯度におけるホイスラの伝搬解析, *J. Atmos. Electr.*, vol. 19, no. 1, 69-79, 1999.
278. Nickolaenko, A. P., M. Hayakawa, I. G. Kudintseva, S. V. Myand, and L. M. Rabinowicz, ELF sub-ionospheric pulse in time domain, *Geophys. Res. Lett.*, vol. 26, 7, 999-1002, 1999.
279. 早川 正士, 地震電磁気現象, *電子情報通信学会誌*, vol. 82, No. 3, 280-282, 1999.
280. Troyan, V. N., N. A. Smirnova, Yu. A. Kopytenko, Th. Peterson, and M. Hayakawa, Development of a complex approach for searching and investigation of electromagnetic precursors of earthquakes: Organization of experiments and analysis procedures, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 147-170, 1999.
281. Galperin, Yu. and M. Hayakawa, On a possibility of parametric amplifier in the stratosphere-mesosphere suggested by active MASSA experiments with the AUREOL-3 satellite, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 429-437, 1999.
282. Gorbatiykov, A. V., T. Kodama, O. A. Molchanov, and M. Hayakawa, Long period variations in seismic and electromagnetic measurements, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 439-450, 1999.
283. Nickolaenko, A. P., M. Hayakawa, and O. A. Molchanov, Geometrical model for the VLF precursory signal at the propagation path Tsushima-Inubo before the Kobe earthquake, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 451-458, 1999.
284. Afonin, V. V., O. A. Molchanov, T. Kodama, M. Hayakawa, and O. A. Akentieva, Statistical study of ionospheric plasma response to seismic activity: Search for reliable result from satellite observations, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 597-617, 1999.
285. Ondoh, T. and M. Hayakawa, Anomalous occurrence of sporadic E-layers before the Hyogoken-Nanbu earthquake, M7.2 of January 17, 1995, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 629-639, 1999.
286. Koshevaya, S., M. Hayakawa, A. Kotsarenko, and N. Kotsarenko, Influence of acoustic wave on the E- and F-layers of the ionosphere, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 647-653, 1999.
287. Molchanov, O. A., A. V. Shvets, and M. Hayakawa, Analysis of lightning-induced ionization from VLF Trimp events, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 959-988, 1999.

288. Shvets, A. V., B. V. Lazebny, A. S. Kukushkin, and M. Hayakawa, Analysis of penetration of VLF atmospherics under water using synchronous measurement on the sea surface and in depth, in "Atmospheric and Ionospheric Electromagnetic Phenomena Associated with Earthquakes," Ed. by M. Hayakawa, Terra Sci. Pub. Co., Tokyo, p. 989-996, 1999.
289. Hirari, M. and M. Hayakawa, Direction of arrival estimation using blind separation of sources, *Radio Sci.*, vol. 34, No. 3, 693-701, 1999.
290. Trakhtengerts, V. Y., Y. Hobara, A. G. Demekhov, and M. Hayakawa, Beam-plasma instability in inhomogeneous magnetic field and second order cyclotron resonance effects, *Phys. Plasma*, vol. 6, 692-698, 1999.
291. Rafalsky, V. A., M. Hayakawa, and A. V. Shvets, Polarization effects for subionospheric ELF/VLF signals penetrated into the seawater, *Atmos. Res.*, vol. 51, 237-244, 1999.
292. Singh, B., R. P. Singh, V. Bansal, M. Kumar, and M. Hayakawa, Anomalous subsurface VLF electric field changes associated with earthquakes and nuclear explosions observed at Agra, *J. Atmos. Electr.*, vol. 19, No. 2, 119-134, 1999.
293. Nickolaenko, A. P. and M. Hayakawa, ELF-pulse propagation from staircase lightning strokes, *J. Atmos. Electr.*, vol. 19, No. 2, 135-146, 1999.
294. Elie, F., M. Hayakawa, M. Parrot, J-L Pincon, and F. Lefeuvre, Neural network system for the analysis of transient phenomena on board the Demeter micro-satellite, *IEICE Trans. Fundamentals*, vol. E82-A, No. 8, 1575-1581, 1999.
295. Hayakawa, M., T. Itoh, and N. Smirnova, Fractal analysis of ULF geomagnetic data associated with the Guam earthquake on August 8, 1993, *Geophys. Res. Lett.*, vol. 26, No. 18, 2797-2800, 1999.
296. Nickolaenko, A. P., M. Hayakawa, and Y. Hobara, Long-term periodical variations in global lightning activity deduced from the Schumann resonance monitoring, *J. Geophys. Res.*, vol. 104, No. D22, 27,585-27,591, 1999.
297. Trakhtengerts, V. Y., Y. Hobara, A. G. Demekhov, and M. Hayakawa, Whistler cyclotron instability and second order cyclotron resonance effects in the magnetosphere, *Adv. Space Res.*, vol. 24, No. 1, 35-42, 1999.
298. Hobara, Y., V. Y. Trakhtengerts, A. G. Demekhov, and M. Hayakawa, Cyclotron amplification of whistler waves, *Adv. Space Res.*, vol. 24, No. 1, 95-98, 1999.
299. Nickolaenko, A. P. and M. Hayakawa, Algorithm for choosing the place for the global Schumann resonance observatory, *Adv. Polar Upper Atmos. Res.*, vol. 13, 119-131, 1999.
300. Burlak, G. N., S. V. Koshevaya, M. Hayakawa, J. Sanchez-Mondragon, and V. V. Grimalsky, Propagation of coupled Rayleigh-gravity waves on the ocean floor, *Geofisica Internacional*, vol. 38, Num. 4, 261-268, 1999.
301. Hobara, Y., V. Y. Trakhtengerts, A. G. Demekhov, and M. Hayakawa, Formation of electron beams under the interaction of a whistler wave packet with the radiation belt electrons, *Adv. Space Res.*, vol. 24, No. 8, 1007-1010, 1999.
302. Trakhtengerts, V. Y., Y. Hobara, A. G. Demekhov, and M. Hayakawa, Self-consistent theory of triggered VLF emissions: an analytical approach, *Adv. Space Res.*, vol. 24, No. 4, 1011-1014, 1999.

303. Myand, S.V., A.P. Nickolaenko, L.M. Rabinowicz, I.G. Kudintseva, and M. Hayakawa, ELF pulses from lightning strokes in the time domain, *Radiophysics and Electronics*, vol. 4, 78 – 82, 1999 (in Russian).
304. Singh, R., B. Singh, V. Bansal, and M. Hayakawa, VLF electromagnetic noise bursts related to major seismic activities observed at Agra, *J. Atmos. Electr.*, vol. 20, No. 1, 7-20, 2000.
305. Hayakawa, M., Yu. Kopytenko, N. Smirnova, V. Troyan, and Th. Peterson, Monitoring ULF magnetic disturbances and schemes for recognizing earthquake precursors, *Phys. Chem. Earth (A)*, vol. 25, No. 3, 263-269, 2000.
306. Sorokin, V. M., V. M. Chmyrev, and M. Hayakawa, The formation of ionosphere-magnetosphere ducts over the seismic zone, *Planet. Space Sci.*, vol. 48, 175-180, 2000.
307. Hayakawa, M., O. A. Molchanov, T. Kodama, T. Tanaka, and T. Igarashi, On a possibility to monitor seismic activity using satellites, *Adv. Space Res.*, vol. 26, No. 6, 993-996, 2000.
308. Hayakawa, M. and O. A. Molchanov, Effect of earthquakes on lower ionosphere as found by subionospheric VLF propagation, *Adv. Space Res.*, vol. 26, No. 8, 1273-1276, 2000.
309. Hayakawa, M., O. A. Molchanov, T. Kodama, V. V. Afonin, and O. A. Akentieva, Plasma density variations observed on a satellite possibly related to seismicity, *Adv. Space Res.*, vol. 26, No. 8, 1277-1280, 2000.
310. Kodama, T., O. A. Molchanov, and M. Hayakawa, NASDA earthquake remote sensing frontier research -Feasibility of satellite observation of seismoelectromagnetics, *Adv. Space Res.*, vol. 26, No. 8, 1281-1284, 2000.
311. Nickolaenko, A. P. and M. Hayakawa, Comment on "Model of red sprites due to intracloud fractal lightning discharges" by J. A. Valdivia, G. M. Milikh, *Radio Sci.*, vol. 35, 3, 921, 2000.
312. Hayakawa, M., T. Itoh, K. Hattori, and K. Yumoto, ULF electromagnetic precursors for an earthquake at Biak, Indonesia on February 17, 1996, *Geophys. Res. Lett.*, vol. 27, No. 10, 1531-1534, 2000.
313. Hayakawa, M., Electromagnetic phenomena associated with earthquakes, *Bulletin of the Univ. of Electro-Comm.*, vol. 13-1, 1-6, 2000.
314. Hobara, Y., V. Y. Trakhtengerts, A. G. Demekhov, and M. Hayakawa, Formation of electron beams by the interaction of a whistler wave packet with radiation belt electrons, *J. Atmos. Solar-terr. Phys.*, vol. 62, 541-552, 2000.
315. Ohta, K. and M. Hayakawa, Three-dimensional ray-tracing for very low latitude whistlers, taking into account the latitudinal and longitudinal gradients of ionosphere, *J. Geophys. Res.*, vol. 105, No. A8, 18,895-18,900, 2000.
316. Hobara, Y., N. Iwasaki, T. Hayashida, T. Tsuchiya, E. R. Williams, M. Sera, Y. Ikegami, and M. Hayakawa, New ELF observation site in Moshiri, Hokkaido Japan and the results of preliminary data analysis, *J. Atmos. Electr.*, vol. 20, No. 2, 99-109, 2000.

317. Hobara, Y., H. Yamaguchi, T. Watanabe, Y. Akinaga, H. C. Koons, J. L. Roeder, and M. Hayakawa, Wide-band ULF/ELF magnetic field measurement in Seikoshi, Izu Japan and some results from preliminary data analysis in relation with seismic activity, *J. Atmos. Electr.*, vol. 20, No. 2, 111-121, 2000.
318. Ohta, K., K. Makita, and M. Hayakawa, On the association of anomalies in subionospheric VLF propagation at Kasugai with earthquakes in the Tokai area, Japan, *J. Atmos. Electr.*, vol. 20, No. 2, 85-90, 2000.
319. Demekhov, A. G. and V. Y. Trakhtengerts, Y. Hobara, and M. Hayakawa, Cyclotron amplification of whistler waves by nonstationary electron beams in an inhomogeneous magnetic field, *Phys. Plasmas*, vol. 7, No. 12, 5153-5158, 2000.
320. 後藤 薫, 早川 正士, 地震前兆波の同定問題に対するブラインド信号分離アルゴリズム応用の提案, *電子情報通信学会論文誌 A*, vol. 183-A, 12, 1477-1485, 2000.
321. Gorbatiykov, A., O. A. Molchanov, M. Hayakawa, S. Uyeda, K. Hattori, T. Nagoya, and A. Nikolaev, 地震発生過程におけるアコースティックエミッション応答, *地震ジャーナル*, vol. 30, 56-63, 2000.
322. Burlak, G., S. Koshevaya, M. Hayakawa, E. Gutierrez-D., and V. Grimalsky, Acousto-optic solitons in fibers, *Optical Rev.*, vol. 7, 323-325, 2000
323. Nickolaenko, A. P., and M. Hayakawa, Comment on "Model of red sprites due to intracloud fractal lightning discharges" by J. A. Valdivia, G. M. Milikh, and K. Papadopoulos, *Radio Science*, vol. 35, no. 3, 921, 2000.
324. 李 成圭, 早川正士, 減衰型無限要素を加味した有限要素法による有限グラウンド上のマイクロストリップ線路のクロストーク問題の解析, *電気学会論文誌 A*, *Trans. IEE of Japan*, vol. 121-A, No. 7, 696-701, 2001.
325. Fukumoto, Y., M. Hayakawa, and P. F. Biagi, Seismic effect on the propagation of subionospheric LF radio waves in Italy, *J. Atmos. Electr.*, vol. 21, no. 1, 1-7, 2001.
326. 大津山卓哉, 早川正士, 太田健次, 雷放電による下部電離層の電離異常, *J. Atmos. Electr.*, vol. 21, no. 1, 49-60, 2001.
327. Hobara, Y., N. Iwasaki, T. Hayashida, M. Hayakawa, K. Ohta, and H. Fukunishi, Interrelation between ELF transients and ionospheric disturbances in association with sprites and elves, *Geophys. Res. Lett.*, vol.28, No. 5, 935-938, 2001.
328. Trakhtengerts, V. Y., Y. Hobara, A. G. Demekhov, and M. Hayakawa, A role of the second-order cyclotron resonance effect in a self-consistent approach to triggered VLF emissions, *J. Geophys. Res.*, vol. 106, A3, 3897-3904, 2001.
329. Singh, B. and M. Hayakawa, Propagation modes of low- and very-low-latitude whistlers, *J. Atmos. Solar-terr. Phys.*, vol. 63, 1133-1147, 2001.
330. Molchanov, O. A. and M. Hayakawa, VLF monitoring of atmosphere-ionosphere boundary as a tool to study planetary waves evolution and seismic influence, *Phys. Chem. Earth, Part C*, vol. 26, No.6, 453-458, 2001.
331. Lee, S., M. Hayakawa, and N. Ishibashi, Radiation from bent transmission lines, *IEICE Trans. Commun.*, vol.E84-B, No.9, 2604-2609, 2001.

332. Kopytenko, Yu., V. Ismagilov, M. Hayakawa, N. Smirnova, V. Troyan, and T. Peterson, Investigation of the ULF electromagnetic phenomena related to earthquakes: contemporary achievements and the perspectives, *ANNALI DI GEOFISICA*, vol.44, N.2, 325-334, 2001.
333. Hayakawa, M., Electromagnetic phenomena associated with earthquakes: Review, *Trans. Inst. Electr. Engrs. of Japan*, vol.121-A, No.10, 893-898, 2001.
334. 早川正士, 巻頭言, 地震電磁気現象, *静電気学会誌*, vol. 25, 5, 237, 2001.
335. 早川正士, 特集解説, 地震に伴う電離層内電磁気現象, *静電気学会誌*, vol. 25, 5, 256-262, 2001.
336. Hayakawa, M. and A. P. Nickolaenko, Lightning effects in mesosphere and associated ELF radio signals, *Proc. Indian Nat'l Science Academy*, vol. 67, A, No.4 & 5, 509-529, 2001.
337. Biagi, P. F., R. Piccolo, A. Ermini, S. Martellucci, C. Bellecci, M. Hayakawa, V. Capozzi, and S. P. Kingsley, Possible earthquake precursors revealed by LF radio signals, *Natural Hazards Earth System Sci.*, vol. 1, 99-104, 2001.
338. Molchanov, O. A., M. Hayakawa, and K. Miyaki, VLF/LF sounding of the lower ionosphere to study the role of atmospheric oscillations in the lithosphere-ionosphere coupling, *Adv. Polar Upper Atmos. Res.*, vol. 15, 146-158, 2001.
339. Lee, S. and M. Hayakawa, A study on the radiation loss from a bent transmission line, *IEEE Trans. Electromagn. Compatibility*, vol. 43, No. 4, 618-621, 2001.
340. Ismaguilov, V. S., Yu. A. Kopytenko, K. Hattori, P. M. Voronov, O. A. Molchanov, and M. Hayakawa, ULF magnetic emission connected with under sea bottom earthquakes, *Natural Hazards Earth System Sci.*, vol. 1, 23-31, 2001.
341. Akinaga, Y., M. Hayakawa, J. Y. Liu, K. Yumoto, and K. Hattori, A precursory ULF signature for the Chi-Chi earthquake in Taiwan, *Natural Hazards Earth System Sci.*, vol. 1, 33-36, 2001.
342. Molchanov, O., A. Kulchitsky, and M. Hayakawa, Inductive seismo-electromagnetic effect in relation to seismogenic ULF emission, *Natural Hazards Earth System Sci.*, vol. 1, 61-67, 2001.
343. Ohta, K., K. Umeda, N. Watanabe, and M. Hayakawa, ULF/ELF emissions observed in Japan, possibly associated with the Chi-Chi earthquake in Taiwan, *Natural Hazards Earth System Sci.*, vol. 1, 37-42, 2001.
344. Smirnova, N., M. Hayakawa, K. Gotoh, and D. Volobuev, Scaling characteristics of ULF geomagnetic field at the Guam seismoactive area and their dynamics in relation to the earthquake, *Natural Hazards Earth System Sci.*, vol. 1, 119-126, 2001
345. Uyeda, S., T. Nagao, K. Hattori, M. Hayakawa, M. Miyaki, O. Molchanov, V. Gladyshev, L. Baransky, A. Schekotov, E. Fedorov, O. Pokhotelov, S. Andreevsky, A. Rozhnoi, Y. Khabazin, A. Gorbatikov, E. Gordeev, V. Chebrov, V. Sinitzin, A. Lutikov, S. Yunga, G. Kosarev, V. Surkov, and G. Belyaev, Geophysical Observatory in Kamchatka region for monitoring of phenomena connected with seismic activity, *Natural Hazards Earth System Sci.*, vol. 1, 3-7, 2001

346. Naaman, Sh., L. S. Alperovich, Sh. Wdowinski, M. Hayakawa, and E. Calais, Comparison of simultaneous variations of the ionospheric total electron content and geomagnetic field associated with strong earthquakes, *Natural Hazards Earth System Sci.*, vol. 1, 53-59, 2001
347. Alperovich, L., V. Zheludev, and M. Hayakawa, Application of a wavelet technique for the detection of earthquake signatures in the geomagnetic field, *Natural Hazards Earth System Sci.*, vol. 1, 75-81, 2001
348. Fukumoto, Y., M. Hayakawa and H. Yasuda, Investigation of over-horizon VHF radio signals associated with earthquakes, *Natural Hazards Earth System Sci.*, vol. 1, 107-112, 2001
349. Gladychiev, V., L. Baransky, A. Schekotov, E. Fedorov, O. Pokhotelov, S. Andreevsky, A. Rozhnoi, Y. Khabazin, G. Belyaev, A. Gorbatikov, E. Gordeev, V. Chebrov, V. Sinitsin, A. Lutikov, S. Yunga, G. Kosarev, V. Surkov, O. Molchanov, M. Hayakawa, S. Uyeda, T. Nagao, K. Hattori, and Y. Noda, Study of electromagnetic emissions associated with seismic activity in Kamchatka region, *Natural Hazards Earth System Sci.*, vol. 1, 127-136, 2001
350. Biagi, P. F., R. Piccolo, A. Ermini, S. Martellucci, C. Bellecci, M. Hayakawa, and S. P. Kingsley, Disturbance in LF radio-signals as seismic precursors, *Annali di Geofisica*, vol. 44, N. 5/6, 1011-1019, 2001
351. Gorbatikov, A. V., O. A. Molchanov, M. Hayakawa, S. Uyeda, K. Hattori, T. Nagao, H. Tanaka, A. V. Nikolaev, and P. Maltsev, Acoustic emission possibly related to earthquakes, observed at Matsushiro, Japan and its implications, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 1-10, Tokyo, 2002
352. Kopytenko, Yu. A., V. S. Ismaguilov, K. Hattori, P. M. Voronov, M. Hayakawa, O. A. Molchanov, E. A. Kopytenko, and D. B. Zaitsev, Monitoring of the ULF electromagnetic disturbances at the station network before EQ in seismic zones of Izu and Chiba peninsulas(Japan), in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 11-18, Tokyo, 2002
353. Hattori, K., Y. Akinaga, M. Hayakawa, K. Yumoto, T. Nagao, and S. Uyeda, ULF magnetic anomaly preceding the 1997 Kagoshima earthquakes, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 19-28, Tokyo, 2002
354. Koons, H. C., J. L. Roeder, Y. Hobara, M. Hayakawa, and A. C. Fraser-Smith, Statistical analysis of the data from the ULF sensors at Seikoshi station, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 29-39, Tokyo, 2002
355. Hobara, Y., H. C. Koons, J. L. Roeder, H. Yamaguchi, and M. Hayakawa, New ULF/ELF observation in Seikoshi, Izu, Japan and the precursory signal in relation with large seismic events at Izu Islands in 2000, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 41-44, 2002

356. Alperovich, L. S., V. Zheludev, and M. Hayakawa, Wavelet study of long - period geomagnetic variations associated with the 1989 M = 7 Loma Prieta and two 1997 M = 6 Japanese earthquakes, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 55-60, Tokyo, 2002
357. Lin, Y., Q. Li, M. Hayakawa, and X. Zeng, Wavelet analysis and seismo - magnetic effect, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 61-68, Tokyo, 2002
358. Grimalsky, V. V., M. Hayakawa, S. V. Koshevaya, G. N. Burlak, and J. Sanchez-Mondragon, Mexico City as seismic resonator, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 87-89, Tokyo, 2002
359. Molchanov, O., A. Kulchitsky, and M. Hayakawa, ULF emission due to inductive seismo-electromagnetic effect, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 153-162, Tokyo, 2002
360. Yunga, S., A. Lutikov, O. Molchanov, and M. Hayakawa, Upward migration of earthquakes as a hint on origin of foreshock activity and other related phenomena, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 167-172, Tokyo, 2002
361. Iudin, D. I., N. V. Korovkin, O. A. Molchanov, V. V. Surkov, and M. Hayakawa, Model of earthquake triggering due to gas-fluid “bubble” upward migration I. Physical rationale, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 177-185, Tokyo, 2002
362. Korovkin, N. V., D. I. Iudin, O. A. Molchanov, M. Hayakawa, and V. V. Surkov, Model of earthquake triggering due to gas-fluid “bubble” upward migration II. Finite-automaton model, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 187-194, Tokyo, 2002
363. Surkov, V. V., D. I. Iudin, O. A. Molchanov, N. V. Korovkin, and M. Hayakawa, Thermofluctuational mechanism of cracks migration as a model of earthquake preparation, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 195-201, Tokyo, 2002
364. Troyan, V. N. and M. Hayakawa, Methods for geophysical data processing in seismic active zones, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 215-221, Tokyo, 2002
365. Hayakawa, M., O. A. Molchanov, N. Shima, A. V. Shvets, and N. Yamamoto, Wavelet analysis of disturbances in subionospheric VLF propagation correlated with earthquakes, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 223-228, Tokyo, 2002
366. Miyaki, K., M. Hayakawa, and O. A. Molchanov, The role of gravity waves in the lithosphere - ionosphere coupling, as revealed from the subionospheric LF propagation data, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, TERRAPUB, 229-232, Tokyo, 2002

367. Ohta, K., K. Umeda, N. Watanabe, and M. Hayakawa, Relationship between ELF magnetic fields and Taiwan earthquake, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 233-237, Tokyo, 2002
368. Biagi, P. F. and M. Hayakawa, Possible premonitory behaviour of LF radiowaves on the occasion of the Slovenia earthquakes ($M = 5.2-6.0-5.1$) occurred on March - May 1998, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 249-253, Tokyo, 2002
369. Fukumoto, Y., M. Hayakawa, and H. Yasuda, Reception of over-horizon FM signals associated with earthquakes, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 263-266, Tokyo, 2002
370. Molchanov, O. A., M. Hayakawa, V. V. Afonin, O. A. Akentieva, and E. A. Mareev, Possible influence of seismicity by gravity waves on ionospheric equatorial anomaly from data of IK-24 satellite 1. Search for idea of seismo-ionosphere coupling, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 275-285, 2002
371. Molchanov, O. A., M. Hayakawa, V. V. Afonin, O. A. Akentieva, E. A. Mareev, and V. Yu. Trakhtengerts, Possible influence of seismicity by gravity waves on ionospheric equatorial anomaly from data of IK-24 satellite 2. Equatorial anomaly and small-scale ionospheric turbulence, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 287-296, Tokyo, 2002
372. Naman, Sh., L. S. Alperovich, Sh., Wdowinski, M. Hayakawa, and E. Calais, Comparison of simultaneous variations of the ionospheric total electron content and geomagnetic field associated with strong earthquakes, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 303-308, 2002
373. Hayakawa, M., O. A. Molchanov, and A. P. Nickolaenko, Model variation in atmospheric radio noise caused by pre-seismic modifications of tropospheric conductivity profile, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 349-352, 2002
374. Ondoh, T. and M. Hayakawa, Seismo discharge model of anomalous sporadic E ionization before great earthquakes, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 385-390, 2002
375. Korepanov, V., O. Molchanov, M. Hayakawa, and G. Lizunov, Coordinated registration of seismogenic effects in the ionosphere by means of remote ground-based and local satellite measurements, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 397-403, 2002
376. Uyeda, S., T. Nagao, K. Hattori, Y. Noda, M. Hayakawa, K. Miyaki, O. Molchanov, V. Gladyshev, L. Baransky, A. Schekotov, G. Belyaev, E. Fedorov, O. Pokhotelov, S. Andreevsky, A. Rozhnoi, Y. Khabazin, A. Gorbatikov, E. Gordeev, V. Chebrov, A. Lutikov, S. Yunga, G. Kosarev, and V. Surkov, Russian-Japanese complex geophysical observatory in Kamchatka for monitoring of phenomena connected with seismic activity, in "Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)", Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 413-419, 2002

377. Gladychyev, V., L. Baransky, A. Schekotov, E. Fedorov, O. Pokhotelov, S. Andreevsky, A. Rozhnoi, Y. Khabazin, G. Belyaev, A. Gorbatikov, E. Gordeev, V. Chebrov, V. Sinitsin, A. Lutikov, S. Yunga, G. Kosarev, V. Surkov, O. Molchanov, M. Hayakawa, S. Uyeda, T. Nagao, K. Hattori, and Y. Noda, Some preliminary results of seismo-electromagnetic research at Complex Geophysical observatory, Kamchatka, in ‘Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)’, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 421-432, 2002
378. Zeng, X., M. Hayakawa, Y. F. Lin, and C. R. Xu, Infrastructural analysis of geomagnetic field and earthquake prediction, in “Seismo Electromagnetics (Lithosphere - Atmosphere - Ionosphere Coupling)”, Ed. by M. Hayakawa and O. A. Molchanov, TERRAPUB, 463-468, 2002
379. Otsuyama, T. and M. Hayakawa, FDTD simulation and experimental result on VLF scattering by ionospheric perturbations in Earth-ionosphere waveguide, Trans. IEE of Japan, vol. 122-A, No. 1, 59-64, 2002.
380. Gotoh, K., Y. Akinaga, M. Hayakawa, and K. Hattori, Principal component analysis of ULF geomagnetic data for Izu islands earthquakes in July 2000, J. Atmos. Electr., vol. 22, No. 1., 1-12, 2002.
381. Trakhtengerts, V. Y., D.I. Iudin, A. V. Kulchitsky, and M. Hayakawa, Kinetics of runaway electrons in a stochastic electric field, Phys. Plasmas, vol. 9, No. 6, 2762-2766, 2002
382. Nagao, T., Y. Enomoto, Y. Fujinawa, M. Hata, M. Hayakawa, Q. Huang, J. Izutsu, Y. Kushida, K. Maeda, K. Oike, S. Uyeda and T. Yoshino, Electromagnetic anomalies associated with 1995 Kobe earthquake, J. Geodynamics, vol. 33, 477-487, 2002.
383. Surkov, V. V., S. Uyeda, H. Tanaka and M. Hayakawa, Fractal properties of medium and seismoelectric phenomena, J. Geodynamics, vol. 33, 519-534, 2002
384. Tronin, A. A., M. Hayakawa and O. A. Molchanov, Thermal IR satellite data application for earthquake research in Japan and China, J. Geodynamics, vol. 33, 477-487, 2002.
385. Uyeda, S., M. Hayakawa, T. Nagao, O. A. Molchanov, K. Hattori, Y. Orihara, K. Gotoh, Y. Akinaga and H. Tanaka, Electric and magnetic phenomena observed before the volcano-seismo activity in 2000 in the Izu Island Region, Japan, Proc. US National Academy of Sci. (PNAS), vol. 99, 7352-7355, 2002.
386. Burlak, G. N., S. V. Koshevaya, S. S. Mansurova and M. Hayakawa, Four-wave acousto-electromagnetic interactions in crystals with a nonlinear electrostriction, Physica D, vol. 166, 197-207, 2002.
387. Shvets, A. V., M. Hayakawa and O. A. Molchanov, Subionospheric VLF monitoring for earthquake-related ionospheric perturbations, J. Atmos. Electr., vol. 22, 87-99, 2002.
388. Kopytenko, Y. A., V. S. Ismaguilov, O. A. Molchanov, E. A. Kopytenko, P. M. Voronov, K. Hattori, M. Hayakawa, and D. B. Zaitzev, Investigation of ULF magnetic disturbances in Japan during seismic active period, J. Atmos. Electr., vol. 22, 207-215, 2002.
389. Hayakawa, M. and T. Otsuyama, FDTD analysis of ELF wave propagation in inhomogeneous subionospheric waveguide models, Appl. Computational Electromagnetics Soc. J., vol. 17, No.3, 239-244, 2002.
390. Soloviev, O. V. and M. Hayakawa, Three-dimensional subionospheric VLF field diffraction by a truncated highly conducting cylinder and its application to the Trimpf effect problem, Radio Sci., vol. 37, No. 5, 1079, doi:10.1029/2001RS002499, 2002.

391. Ando, Y., M. Hayakawa, and O. A. Molchanov, Theoretical analysis on the penteration of power line harmonic radiation into the ionosphere, *Radio Sci.*, vol.37, No. 6, 1093, doi: 10.1029/2001RS002486, 2002.
392. Hayakawa, M., N. V. Korovkin, D. I. Iudin, E. E. Selina, and V. Y. Trakhtengerts, Surface discharge cellular automaton model, in "Ultra-Wideband, Short-Pulse Electromagnetics 5", Ed. by P. D. Smith and S. R. Cloude, Kluwer Academic/Plenum Pub., New York, 53-58, 2002.
393. Singh, B., M. Hayakawa, P. K. Mishra, R. P. Singh and D. R. Laskshmi, VLF electromagnrtic noise bursts observed in a borehole and their relation with low-latitude hiss, *J. Atmos. Solar-terr. Phys.*, vol. 65, 269-276, 2003.
394. Surkov, V. V., O. A. Molchanov and M. Hayakawa, Pre-earthquake ULF electromagnetic perturbation as a result of inductive seismomagnetic phenomena during microfracturing, *J. Atmos. Solar-terr. Phys.*, vol. 65, 31-46, 2003.
395. Hayakawa, M. and K. Ohta, The importance of direction finding technique in general VLF studies, in "Very Low Frequency (VLF) Phenomena", Ed. by A.R.W. Hughes, C. Ferencz and A.K. Gwal, p. 22-35, Narosa Pub. House, New Delhi, 2003.
396. Singh, B. and M. Hayakawa, Propagation modes of low and very low latitude whistlers, "Very Low Frequency (VLF) Phenomena", Ed. by A.R.W. Hughes, C. Ferencz and A.K. Gwal, p.174-199, Narosa Pub. House, New Delhi, 2003.
397. Ando, Y., N. Guan, K. Yashiro, S. Ohkawa and M. Hayakawa, An analysis of excitation of magnetostatic surface waves in an in-plane magnetized YIG film by the integral kernel expansion method, *IEEE Trans. Microwave Theory and Techniques*, vol. 20, 492-499, 2003.
398. Grimalsky V.V., Hayakawa M., Ivchenko V.N., Rapoport Yu.G., and Zadoroznji V.I., Penetration of an electrostatic field from the lithosphere into the ionosphere and its effect on the D-region before earthquakes, *J. Atmos. Solar-terr. Phys.*, vol. 65, 391-407, 2003.
399. Hayakawa, M., K. Hattori, A. P. Nickolaenko, and L. M. Rabinowicz, Periodic variations in the Hurst exponent of the geomagnetic field, *J. Atmos. Electr.*, vol.23, No.1, 31-39, 2003.
400. Gotoh, K. M. Hayakawa and N. Smirnova, Fractal analysis of the gromagnetic data obtained at Izu Peninsula, Japan in relation to the nearby earthquake swarm of June-August 2000, *Natural Hazards Earth System Sci.*, vol. 3, 229-236, 2003.
401. Trakhtengerts, V. Y., A. G. Demekhov, Y. Hobara and M. Hayakawa, Phase-bunching in triggered VLF emissions: Antenna effect, *J. Geophys. Res.*, vol.108, No. A4, 1160, doi:10.1029/2202JA9415, 2003.
402. Trakhtengerts, V. Y., D. I. Iudin, A. V. Kluchitsky and M Hayakawa, Electron acceleration by a stochastic electric field on the atmospheric layer, *Phys. Plasma*, vol. 10, No. 8, 3290-3296, 2003.
403. Ismaguilov, V. S., Yu. Kopytenko, K. Hattori, and M. Hayakawa, Variations of phase velocity and gradient values of ULF geomagnetic disturbances connected with the Izu strong earthquakes, *Natural Hazard Earth System Sci.*, vol. 3, 211-215, 2003.
404. Iudin D. I., V. Y. Trakhtegerts and M. Hayakawa, Fractal dynamics of electric discharges in a thundercloud, *Phys. Rev. E*, vol. 68, 016601, 2003.

405. Bogdano, Yu. A. I. G. Zakharov, O. F. Tyrnov and M. Hayakawa, Electromagnetic effect associated with regional seismic activity in Crimea during the interval July-August 2002, *J. Atmos. Electr.*, vol. 23, 2, 57-67, 2003.
406. Singh, R. P., B. Singh, P. K. Mishra and M. Hayakawa, On the lithosphere-atmosphere coupling of seismo-electromagnetic signals, *Radio Sci.*, vol.38, No.4, 1065, doi:10.1029/2002RS002683, 2003.
407. 太田健次, 花井伸一, 原俊介, 早川正士, Observations of subionospheric JG2AS Signal as precursor of the earthquakes, *J. Atmos. Electr.*, vol.23, 85-95, 2003.
408. Hobara, Y., M. Hayakawa, K. Ohta and H. Fukunishi, Lightning discharges in association with mesospheric optical phenomena in Japan and their effect on the lower ionosphere, *Adv. Polar Upper Atmos. Res.*, no. 17, 30-47, 2003.
409. Otsuyama, T., T. Kariya and M. Hayakawa, VLF signatures of ionospheric perturbation in the Hokuriku area of Japan, *Adv. Polar Upper Atmos. Res.*, no. 17, 109-119, 2003.
410. Alperovich, L., V. Zheludev and M. Hayakawa, Use of wavelet analysis for detection of seismogenic ULF emissions, *Radio Sci.*, vol. 38, No. 6, 1093, doi:10.1029/2002RS002687, 2003.
411. Otsuyama, T., D. Sakuma and M. Hayakawa, FTDT analysis of ELF wave propagation and Schumann resonance for a subionospheric waveguide model, *Radio Sci.*, vol. 38, No.6, 1103, doi:10.1029/2002RS002752, 2003.
412. Hayakawa, M., Is earthquake prediction possible by means of electromagnetic phenomena? *IEEJ (Inst. Electr. Engrs. Japan) Trans. Fundamentals and Materials*, vol. 124, No. 1, 3-4, 2004.
413. Hayakawa, M., K. Hattori and Y. Ando, Natural electromagnetic phenomena and electromagnetic theory: Review, *IEEJ Trans. Fundamentals and Materials*, vol. 124, No. 1, 72-79, 2004.
414. Tsuji, A. and M. Hayakawa, Numerical aspects in the calculation of the transient lightning electromagnetic radiation over lossy ground, *IEEJ Trans. Fundamentals and Materials*, vol. 124, No. 1, 67-71, 2004.
415. Hayakawa, M., T. Nakamura, Y. Hobara and E. Williams, Observation of sprites over the Sea of Japan and conditions for lightning-induced sprites in winter, *J. Geophys. Res.*, vol. 109, A01312, doi:10.1029/2003JA009905, 2004.
416. Otsuyama, T., J. Manaba, M. Hayakawa, and M. Nishimura, Characteristics of subionospheric VLF perturbation associated with winter lightning around Japan, *Geophys. Res. Lett.*, vol. 31, L04117, doi:10.1029/2003GL019064, 2004.
417. Singh, V., B. Singh, M. Hayakawa, M. Kumar, V. Kushwah, and O. P. Singh, Nighttime amplitude decrease in 19.8kHz NWC signals observed at Agra possibly caused by moderate seismic activities along the propagation path, *J. Atmos. Electr.*, vol. 24, 1-15, 2004
418. Nickolaenko, A. P., S. O. Nikolayenko, Yu. Schekotov, and M. Hayakawa, Alternative interpretation of ionospheric Alfvén resonance, *J. Atmos. Electr.*, vol. 24, 17-30, 2004
419. 太田健次, 原俊介, 早川正士, TT法による地震電磁気前兆現象の検出改善, *J. Atmos. Electr.*, vol. 24, 31-38, 2004.

420. Nickolaenko, A. P., L. M. Rabinowicz, and M. Hayakawa, Time domain presentation for ELF pulses with accelerated convergence, *Geophys. Res. Lett.*, vol. 31, L05808, doi: 10.1029/2003GL018700, 2004.
421. Hayakawa, M., K. Hattori, A. P. Nickolaenko, and L. M. Rabinowicz, Relation between the energy of earthquake swarm and the Hurst exponent of random variations of the geomagnetic field, *Phys. Chem. Earth*, vol. 29, 379-387, 2004.
422. Gotoh, K., M. Hayakawa, N. A. Smirnova, and K. Hattori, Fractal analysis of seismogenic ULF emissions, *Phys. Chem. Earth*, vol. 29, 419-424, 2004
423. Hattori, K., A. Serita, K. Gotoh, C. Yoshino, M. Harada, N. Isezaki and M. Hayakawa, ULF geomagnetic anomaly associated with 2000 Izu Islands earthquake swarm, Japan, *Phys. Chem. Earth*, vol. 29, 425-435, 2004.
424. Hobara, Y., H. C. Koons, J. L. Roeder, K. Yumoto and M. Hayakawa, Characteristics of ULF magnetic anomaly before earthquakes, *Phys. Chem. Earth*, vol. 29, 437-444, 2004.
425. Smirnova, N., M. Hayakawa, and K. Gotoh, Precursory behavior of fractal characteristics of the ULF electromagnetic fields in seismic active zones before strong earthquakes, *Phys. Chem. Earth*, vol. 29, 445-451, 2004.
426. Hattori, K., I. Takahashi, C. Yoshino, N. Isezaki, H. Iwasaki, M. Harada, K. Kawabata, E. Kopytenko, Y. Kopytenko, P. Maltsev, V. Korepanov, O. Molchanov, M. Hayakawa Y. Noda, T. Nagao, and S. Uyeda, ULF geomagnetic field measurements in Japan and some recent results associated with Iwateken Nairiku Hokubu earthquake in 1998, *Phys. Chem. Earth*, vol. 29, 481-494, 2004.
427. Kulchitsky, A. V., Y. Ando and M. Hayakawa, Numerical analysis on the propagation of ULF/ELF signals in the lithosphere with highly conductive layers, *Phys. Chem. Earth*, vol. 29, 495-500, 2004.
428. Biagi, P. F., R. Piccolo, L. Castellana, A. Ermini, S. Martellucci, C. Bellecci, V. Capozzi, G. Perna, O. Molchanov and M. Hayakawa, Variations in a LF radio signal on the occasion of the recent seismic and volcanic activity in Southern Italy, *Phys. Chem. Earth*, vol. 29, 551-557, 2004.
429. Rapoport, Y., V. Grimalsky, M. Hayakawa, V. Ivchenko, D. Juarez-R, S. Koshevaya and O. Gotynyan, Change of ionospheric plasma parameters under the influence of electric field which has lithospheric origin and due to radon emanation, *Phys. Chem. Earth*, vol. 29, 579-587, 2004.
430. Rozhnoi, A., M. S. Solovieva, O. A. Molchanov and M. Hayakawa, Middle latitude LF (40 kHz) phase variations associated with earthquakes for quiet and disturbed geomagnetic conditions, *Phys. Chem. Earth*, vol. 29, 589-598, 2004.
431. Koshevaya, S., M. Hayakawa, V. Grimalsky, J. Siqueiros-A, A. Perez-E and A. Kotsarenko, Modeling of nonlinear passage of acoustic waves caused by underground fracturing through the lithosphere, *Phys. Chem. Earth*, vol. 29, 599-605, 2004.
432. Hayakawa, M., O. A. Molchanov, NASDA/UEC team, Summary report of NASDA's earthquake remote sensing frontier project, *Phys. Chem. Earth*, vol. 29, 617-625, 2004.
433. Shvets, A. V., M. Hayakawa, O. A. Molchanov, and Y. Ando, A study of ionospheric response to regional seismic activity by VLF radio sounding, *Phys. Chem. Earth*, vol. 29, 627-637, 2004.

434. Soloviev, O. V., M. Hayakawa, V. I. Ivanov and O. A. Molchanov, Seismo-electromagnetic phenomenon in the atmosphere in terms of 3D subionospheric radio wave propagation problem, *Phys. Chem. Earth*, vol. 29, 639-647, 2004.
435. Molchanov, O. A., A. Yu. Schekotov, E. Federov and M. Hayakawa, Ionospheric Alfvén resonance at middle latitudes: results of observations at Kamchatka, *Phys. Chem. Earth*, vol. 29, 649-655, 2004.
436. 中村貴弘, 早川正士, 北陸冬季雷に伴う中間圏発光現象とその原因となる雷放電特性, *電気学会論文誌 B*, vol. 124, No.8, 1012-1020, 2004.
437. Sekiguchi, M., M. Hayakawa, Y. Hobara, A. Nickolaenko and E. Williams, Links of Schumann resonance intensity with average global land temperature, *Radiophysics and Electronics*, vol. 9, no. 2, 383-391, 2004 (in Russian).
438. Molchanov, O. A., A. Yu. Schekotov, E. Fedorov, G. G. Belyaev, M. S. Solovieva and M. Hayakawa, Preseismic ULF effect and possible interpretation, *Ann. Geophys. (Italy)*, vol. 47, N.1, 119-132, 2004.
439. Sorokin, V. M., E. N. Federov, A. Yu. Schekotov, O. A. Molchanov and M. Hayakawa, Depression of the ULF geomagnetic pulsation related to ionospheric irregularities, *Ann. Geophys. (Italy)*, vol. 47, N. 1, 191-198, 2004.
440. Hayakawa, M., O. A. Molchanov, A. Y. Schekotov, and E. Fedorov, Observation of ionospheric Alfvén resonance at a middle latitude station, *Adv. Polar Upp. Atmos. Res.*, No. 18, 65-76, 2004.
441. Otsuyama, T., J. Manabe and M. Hayakawa, Characteristics of subionospheric VLF perturbations associated with winter lightning around Japan, *Adv. Polar Upp. Atmos. Res.*, No. 18, 77-86, 2004.
442. Surkov, V. V., O.A. Pokhotelov, M. Parrot, E. N. Fedorov and M. Hayakawa, Excitation of the ionospheric resonance cavity by neutral winds at middle latitudes, *Ann. Geophysicae*, vol. 22, 2877-2889, 2004.
443. Hayakawa, M., O. A. Molchanov and NASDA/UEC team, Achievements of NASDA's Earthquake Remote Sensing Frontier Project, *Terr. Atmos. Ocean. Sci.*, vol. 15, 311-328, 2004.
444. Biagi, P.F., R. Piccolo, L. Castellana, T. Maggipinto, A. Ermini, S. Martellucci, C. Bellecci, G. Perna, V. Capozzi, O. A. Molchanov, M. Hayakawa, and K. Ohta, VLF-LF radio signals collected at Bari (South Italy): a preliminary analysis on signal anomalies associated with earthquakes, *Natural Hazards Earth System Sci.*, vol. 4, 685-689, 2004.
445. Molchanov, O., E. Fedorov, A. Schekotov, E. Gordeev, V. Chebrov, V. Surkov, A. Rozhnoi, S. Andreevsky, D. Iudin, S. Yunga, A. Lutikov, M. Hayakawa, and P. F. Biagi, Lithosphere – atmosphere – ionosphere coupling as governing mechanism for preseismic short-term events in atmosphere and ionosphere, *Natural Hazards Earth System Sci.*, vol. 4, 757-767, 2004.
446. Shvets, A. V., M. Hayakawa, and S. Maekawa, Results of subionospheric radio LF monitoring prior to the Tokachi (m=8, Hokkaido, 25 September 2003) earthquake, *Natural Hazards Earth System Sci.*, vol. 4, 647-653, 2004.
447. Surkov, V.V., O.A. Molchanov, and M. Hayakawa, A direction finding technique for the ULF electromagnetic source, *Natural Hazards Earth System Sci.*, vol. 4, 513-517, 2004.

448. 松戸悠, 亀田智史, 安藤芳晃, 早川正士, スプライトの連続光学観測システムの構築, 高速信号処理応用技術学会誌, vol. 7, No. 2, 29-42, 2004.
449. Hayakawa, M. and K. Hattori, Ultra-low-frequency electromagnetic emissions associated with earthquakes, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1101-1108, 2004.
450. Lizunov, G. and M. Hayakawa, Atmospheric gravity waves and their role in the lithosphere – troposphere – ionosphere interaction, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1109-1120, 2004.
451. Otsuyama, T. and M. Hayakawa, FDTD analysis of ELF wave propagation for realistic subionospheric waveguide, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1203-1209, 2004.
452. Nickolaenko, A. P., L. M. Rabinowicz, and M. Hayakawa, Natural ELF pulses in the time Domain : Series with accelerated convergence, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1210-1215, 2004.
453. Soloviev, O. V. and M. Hayakawa, 3D modeling method of VLF subionospheric radio wave propagation allowing for a localized ionospheric perturbation, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1216-1224, 2004.
454. Ando, A. and M. Hayakawa, 2-D finite difference analyses of Schumann resonance and identification of lightning distribution, IEEJ Trans. Fundamentals and Materials, vol. 124, No. 12, 1225-1231, 2004.
455. Hayakawa, M., Electromagnetic phenomena associated with earthquakes: A frontier in terrestrial electromagnetic noise environment, Recent Res. Devel. Geophysics, vol. 6, 81-112, 2004.
456. Ida, Y., M. Hayakawa, A. Adalev, and K. Gotoh, Multifractal analysis for the ULF geomagnetic data during the 1993 Guam earthquake, Nonlinear Processes Geophys., vol. 12, 157-162, 2005.
457. 太田健次, 渡辺伸夫, 早川正士, ELF帯電磁波を用いた地震前兆現象の観測, J. Atmos. Electr., vol.25, No1, 11-18, 2005.
458. Hayakawa, M., T. Gotoh, and M. Ikeda, A network of reception of over-horizon VHF signals associated with earthquakes and some preliminary results, J. Atmos. Electr., vol.25, No.1, 19-28, 2005.
459. Ando, Y, P. Maltsev, A. Sukhynyuk, T. Goto, T. Yamauchi, Y. Hobara, M. Sekiguchi, Y. Ikegami, M. Sera, V. Korepanov, and M. Hayakawa, New ELF observation system at Moshiri, Japan and assessment of acquired data, J. Atmos. Electr., vol.25, No.1, 29-39, 2005.
460. Adalev, A. S. N. V. Korovkin, and M. Hayakawa, Enhancement of EMI Immunity of Cables using Periodical and Quasi-periodical Structures Optimized by the Genetic Algorithm, IEEJ Trans. Fundamentals and Materials, vol. 125, No.4, 350-358, 2005
461. Bondarenko, A.V., M. Hayakawa, N. V. Korovkin, and E.E. Selina, A general modeling method of synthesis of complex technical and biological system, Special Issue on Electromagnetic Compatibility, IEEJ, Trans. Fundamentals and Materials, vol. 125, No.7, 577-582, 2005.

462. Dong, J., Y. Gao and M. Hayakawa, Analysis on subaerial electric field radiated by a unit electric current source in the ground, Special Issue on Electromagnetic Compatibility, IEEJ, Trans. Fundamentals and Materials, vol. 125, No.7, 591-595, 2005
463. Hayakawa, M, T. Nakamura, D. Iudin, K. Michimoto, T. Suzuki, T. Hanada, and T. Shimura, On the structure of thunderstorms leading to the generation of sprites and elves: Fractal analysis, J. Geophys. Res., vol. 110, D06104, doi:10.1029/2004JD004545, 2005.
464. Ando, Y., M. Hayakawa, A. V. Shvets and A. P. Nickolaenko, Finite difference analysis of Schumann resonance and reconstruction of lightning discharge, Radio Sci., vol. 40, RS2002, doi:10.1029/2004RS003153, 2005.
465. Surkov, V. V., O. A. Molchanov, M. Hayakawa, and E. N. Federov, Excitation of the ionospheric resonance cavity by thunderstorms, J. Geophys. Res., Vol. 110, A04608, doi: 10.1029/2004JA040850, 2005.
466. Singh, B., V. Kushwah, V. Singh, M. Tomar and M. Hayakawa, Simultaneous ULF/VLF amplitude anomalies observed during moderate earthquakes in India region, Indian J. Radio and Space Phys., vol. 34, 221-232, August 2005.
467. Sorokin, V. M., A. K. Yaschenko, V. M. Chmyrev, and M. Hayakawa, DC electric field amplification in the mid-latitude ionosphere over seismically active faults, Natural Hazards Earth System Sci., vol. 5, 661-666, 2005.
468. Hayakawa, M., M. Sekiguchi, and A.P. Nickolaenko, Diurnal variations of electric activity of global thunderstorms deduced from OTD data, J. Atmos. Electr., vol. 25, No.2, 55-68, 2005
469. Rozhnoi, A. A., M.S. Solovieva, O. A. Molchanov, M. Hayakawa, and P. F. Biagi, Anomalies of LF signal during seismic activity in November-December 2004, Natural Hazards Earth System Sci., vol. 5, 657-660, 2005.
470. Serita, A., K. Hattori, C. Yoshino, M. Hayakawa, and N. Isezaki, Principal component analysis and singular spectrum analysis of ULF geomagnetic data associated with earthquakes, Natural Hazards Earth System Sci., vol. 5, 685-689, 2005.
471. Biagi, P. F., L. Castellana, T. Muggipinto, R. Piccolo, A. Minafra, A. Ermini, S. martellucci, C. Bellecci, G. Perna, V. Capozzi, O. A. Molchanov, and M. Hayakawa, A possible preseismic anomaly in the ground wave of a radio broadcasting (216 kHz) during July-August 1998 (Italy), Natural Hazards Earth System Sci., vol. 5, 727-732, 2005.
472. Sorokin, V. M., N. V. Isaev, A. K. Yaschenko, V. M. Chmyrev, and M. Hayakawa, Strong DC electric field formation in the low latitude ionosphere over typhoons, J. Atmos. Solar-Terr. Phys., vol. 67, 1269-1279, 2005.
473. Hayakawa, M., A.V. Shvets, and S. Maekawa, Subionospheric LF monitoring of ionospheric perturbations prior to the Tokachi-oki earthquake and a possible mechanism to lithosphere – ionosphere coupling, Adv. Polar. Upper Atmos. Res., vol. 19, 42-54, 2005.
474. Ohta, K., N. Watanabe, and M. Hayakawa, The observation of ULF emissions at Nakatsugawa in possible association with the 2004 Mid Niigata Prefecture earthquake, Earth Planets Space, vol. 57, 1103–1108, 2005.
475. Mitsutake, G., K. Otsuka, M. Hayakawa, G. Cornélissen and F. Halberg, Does Schumann resonance affect our blood pressure?, Biomedicine and Pharmacotherapy, vol. 59, S10-S14, 2005

476. Molchanov, O., A. Schekotov, M. Solovieva, E. Fedorov, V. Gladyshev, E. Gordeev, V. Chebrov, D. Saltykov, V.I. Sinitsin, K. Hattori, and M. Hayakawa, Near-seismic effects in ULF fields and seismo-acoustic emission: statistics and explanation, *Natural Hazards Earth System Sci.*, vol. 5, 1-10, 2005.
477. Kotsarenko, A., O. Molchanov, M. Hayakawa, S. Koshevaya, V. Grimalsky, R. PérezEnríquez, and J.A. López Cruz-Abeyro, Investigation of ULF magnetic anomaly during Izu earthquake swarm and Miyakejima volcano eruption at summer 2000, Japan, *Natural Hazards Earth System Sci.*, vol. 5, 63-69, 2005.
478. Hayakawa, M., K. Ohta, A.P. Nikolaenko, and Y. Ando, Anomalous effect in Schumann resonance phenomena observed in Japan, possibly associated with the Chi-chi earthquake in Taiwan, *Ann. Geophysicae*, vol. 23, 1335-1346, 2005.
479. Kushwah, V., V. Singh, B. Singh, and M. Hayakawa, Ultra low frequency (ULF) magnetic field anomalies observed at Agar and their relation to moderate seismic activities in Indian region, *J. Atmos. Solar-terr. Phys.*, vol. 67, 992-1001, 2005.
480. Sato, T., Y. Miyazaki, M. Hayakawa and M. Koshihara, Recent trend of electromagnetic theory in advanced technology and society, *IEEJ Trans. Fundamentals and Materials*, vol. 126, 1, 5-7, 2006.
481. Ando, Y. and M. Hayakawa, Recent studies on Schumann resonance, *IEEJ Trans. Fundamentals and Materials*, vol. 126, 1, 28-30, 2006.
482. Hayakawa, M., Recent progress in seismo electromagnetics (Electromagnetic phenomena associated with earthquakes), *IEEJ Trans. Fundamentals and Materials*, vol. 126, 1, 43-44, 2006.
483. Adalev, A.S., N.V. Korovkin and M. Hayakawa, Identification of electric circuits described by ill-conditioned mathematical models, *IEEE Trans. Circuits and Systems*, vol. 53, no. 1, 78~91, 2006.
484. Cervone, G., S. Maekawa, R.P. Singh, M. Hayakawa, M. Kafatos, and A. Shvets, Surface latent heat flux and nighttime LF anomalies prior to the $M_w=8.3$ Tokachi-Oki earthquake, *Natural Hazards Earth System Sci.*, vol. 6, 109-114, 2006.
485. Hayakawa, M., and K. Ohta, The importance of direction finding technique for the study of VLF/ELF sferics and whistlers, *IEEJ Trans. Fundamentals and Materials*, vol. 126, No.2, 65-70, 2006.
486. Suzuki, T., M. Hayakawa, Y. Hobara, K. Michimoto, and T. Hanada, Characteristics of the sprite parent winter thundercloud with positive single flash in Hokuriku, Japan (A case study on 14th December 2001), *IEEJ Trans. Fundamentals and Materials*, vol. 126, No.2, 78-83, 2006.
487. Surkov, V.V., M. Hayakawa, A.Y. Schekotov, E.N. Fedorov and O.A. Molchanov, Ionospheric Alfvén resonator excitation due to nearby thunderstorms, *J. Geophys. Res.*, vol. 111, A01303, doi:10.1029/2005 JA011320, 2006.
488. Hayakawa, M., Electromagnetic phenomena associated with earthquakes, *IEEJ Trans. Fundamentals and Materials*, vol. 126, No.4, 211-214, 2006.
489. Ida, Y., M. Hayakawa, and K. Gotoh, Multifractal analysis for the ULF geomagnetic data during the Guam earthquake, *IEEJ Trans. Fundamentals and Materials*, vol. 126, No.4, 215-219, 2006.

490. Maekawa, S., and M. Hayakawa, A statistical study on the dependence of characteristics of VLF/LF terminator, *IEEJ Trans. Fundamentals and Materials*, vol. 126, No.4, 220-226, 2006.
491. Ando, Y. and M. Hayakawa, Implementation of the perfect matched layer to the CIP method, *IEICE Trans. Electron.*, vol. E89-C, No.5, 645-648, 2006.
492. Hobara, Y., M. Hayakawa, E. Williams, R. Boldi and E. Downes, Location and electrical properties of sprite-producing lightning from a single ELF site, in "Sprites, Elves and Lightning Discharges", Ed. by M. Fuellekrug, E. A. Mareev and M. J. Rycroft, 211-235, Springer, 2006.
493. Nickolaenko, A. P., M. Hayakawa and M. Sekiguchi, Variations in global thunderstorm activity inferred from the OTD records, *Geophys. Res. Lett.*, vol.33, L06823, doi:10.1029/2005 GL024884, 2006.
494. 太田健次, 石野博一, 渡邊伸夫, 早川正士, 紀伊半島沖地震, 新潟中越地震, スマトラ沖地震の前兆的現象の観測, *J. Atmos. Electr.*, vol. 26, No. 1, 11-24, 2006.
495. Suzuki, T., M. Hayakawa, Y. Matsudo, and K. Michimoto, How do winter thundercloud systems generate sprite-inducing lightning in the Hokuriku area of Japan, *Geophys. Res. Lett.*, vol.33, L10806, doi: 10.1029/2005GL025433, 2006.
496. Adalev, A. S., M. Hayakawa, D. I. Iudin, N. V. Korovkin, E. E. Selina, and V. Yu. Traktengerts, Cellular automaton modeling of surface discharge dynamics for EMC problems, *IEICE Electronics Express*, vol.3, No.10, 209-215, 2006.
497. Sorokin, V. M., A. K. Yaschenko, and M. Hayakawa, Formation mechanism of the lower -ionospheric disturbances by the atmosphere electric current over a seismic region, *J. Atmos. Solar-terr. Phys.*, vol. 68, 1260-1268, 2006.
498. Adalev, A. S., N. V. Korovkin, M. Hayakawa and J. B. Nitsch, Deembedding and Undermining Microwave Fixtures with the Genetic Algorithm, *IEEE Trans. Microwave Theory and Techniques*, vol. 54, No.7, 3131-3140, 2006.
499. 早川正士, 地震電磁気現象の計測技術と研究動向, *電子情報通信学会論文誌*, vol. J89-B, No. 7, 1036-1045, 2006.
500. Surkov, V. V., O. A. Pokhotelov, M. Parrot and M. Hayakawa, On the origin of stable IR anomalies detected by satellites above seismo-active regions, *Phys. Chem. Earth*, vol. 31, 164-171, 2006.
501. Bashkuev, Yu. B., V. P. Melchinov, D. G. Buyanova, L. Kh. Angarkhaeva, M. G. Dembelov, V. B. Khaptanov and M. Hayakawa, Cryosphere of the earth and its influence on electromagnetic processes in seismoactive mountainous areas, *Phys. Chem. Earth*, vol. 31, 182-188, 2006.
502. Bashkuev, Yu. B., V. B. Khaptanov, M. G. Dembelov, L. Kh. Angarkhaeva, V. P. Boleev and M. Hayakawa, Radioprobng of underground structure of the Failure Gulf, formed as a result of the M7.5 Tsagan earthquake, *Phys. Chem. Earth*, vol. 31, 210-214, 2006.
503. Alperovich, L., E. Morozov, M. Hayakawa and K. Hattori, Coherence of the ULF fields in the seismoactive zone of Japan, *Phys. Chem. Earth*, vol. 31, 248-257, 2006.
504. Troyan, V., M. Hayakawa and Yu. Kiselev, Restoration of seismic parameters and electrical conductivity by the diffraction tomography method, *Phys. Chem. Earth*, vol. 31, 268-272, 2006.

505. Surkov, V. V., and M. Hayakawa, ULF geomagnetic perturbations due to seismic noise produced by rock fracture and crack formation treated as a stochastic process, *Phys. Chem. Earth*, vol. 31, 273-280, 2006.
506. Hattori, K., A. Serita, C. Yoshino, M. Hayakawa and N. Isezaki, Singular spectral analysis and principal component analysis for signal discrimination of ULF geomagnetic data associated with 2000 Izu Island earthquake swarm, *Phys. Chem. Earth*, vol. 31, 281-291, 2006.
507. Kopytenko, Yu. A., V. S. Ismaguilov, K. Hattori and M. Hayakawa, Determination of heart position of a forthcoming strong EQ using gradients and phase velocities of ULF geomagnetic disturbances, *Phys. Chem. Earth*, vol. 31, 292-298, 2006.
508. Guglielmi, A., M. Hayakawa, A. Potapov and B. Tsegmed, Polarization method to detect the co-seismic magnetic oscillations, *Phys. Chem. Earth*, vol. 31, 299-304, 2006.
509. Schekotov, A., O. Molchanov, K. Hattori, E. Fedorov, V. A. Gladyshev, G. G. Belyaev, V. Chebrov, V. Sinitsin, E. Gordeev and M. Hayakawa, Seismo-ionospheric depression of the ULF geomagnetic fluctuations at Kamchatka and Japan, *Phys. Chem. Earth*, vol. 31, 313-318, 2006.
510. Singh, V., B. Singh, M. Kumar and M. Hayakawa, Identification of earthquake sources responsible for subsurface VLF electric field emissions observed at Agra, *Phys. Chem. Earth*, vol. 31, 325-335, 2006.
511. Bushkuev, Yu. B., I. B. Naguslaeva, Yu. P. Malyshkov, D. G. Buyanova and M. Hayakawa, Electromagnetic "seismic calm" effect in the Baikal rift zone, *Phys. Chem. Earth*, vol. 31, 336-340, 2006.
512. Schekotov, A. Yu., O. A. Molchanov and M. Hayakawa, A study of atmospheric influence from earthquake statistics, *Phys. Chem. Earth*, vol. 31, 341-345, 2006.
513. Hayakawa, M., K. Ohta, S. Maekawa, T. Yamauchi, Y. Ida, T. Gotoh, N. Yonaiguchi, H. Sasaki and T. Nakamura, Electromagnetic precursors to the 2004 Mid Niigata Prefecture earthquake, *Phys. Chem. Earth*, vol. 31, 356-364, 2006.
514. Ondoh, T., and M. Hayakawa, Synthetic study of precursory phenomena of the M7.2 Hyogo-ken Nanbu earthquake, *Phys. Chem. Earth*, vol. 31, 378-388, 2006.
515. Ohta, K., N. Watanabe and M. Hayakawa, Survey of anomalous Schumann resonance phenomena observed in Japan, in possible association with earthquakes in Taiwan, *Phys. Chem. Earth*, vol. 31, 397-402, 2006.
516. Biagi, P. F., L. Castellana, T. Maggipinto, R. Piccolo, A. Minafra, A. Ermini, S. Martellucci, C. Bellecci, G. Perna, V. Capozzi, O. A. Molchanov and M. Hayakawa, LF radio anomalies revealed in Italy by the wavelet analysis: Possible preseismic effects during 1997-1998, *Phys. Chem. Earth*, vol. 31, 403-408, 2006.
517. Rozhnoi, A. A., M. S. Solovieva, O. A. Molchanov, M. Hayakawa, S. Maekawa and P. F. Biagi, Sensitivity of LF signal to global ionosphere and atmosphere perturbations in the network of stations, *Phys. Chem. Earth*, vol. 31, 409-415, 2006.
518. Rozhnoi, A. A., M. S. Solovieva, O. A. Molchanov, V. Chebrov, V. Voropaev, M. Hayakawa, S. Maekawa and P. F. Biagi, Preseismic anomaly of LF signal on the wave path Japan-Kamchatka during November-December 2004, *Phys. Chem. Earth*, vol. 31, 422-427, 2006.

519. Soloviev, O. V., M. Hayakawa and O. A. Molchanov, Seismo-electromagnetic phenomenon in terms of 3D vector problem of subionospheric radio wave propagation across the solar terminator, *Phys. Chem. Earth*, vol. 31, 428-436, 2006.
520. Rapoport, Yu. G., O. E. Gotynyan, V. N. Ivchenko, M. Hayakawa, V. V. Grimalsky, S. V. Koshevaya and D. Juarez-R., Modeling electrostatic –photochemistry seismoionospheric coupling in the presence of external currents, *Phys. Chem. Earth*, vol. 31, 437-446, 2006.
521. Sorokin, V. M., A. K. Yaschenko, V. M. Chmyrev and M. Hayakawa, DC electric field amplification in the mid-latitude ionosphere over seismically active faults, *Phys. Chem. Earth*, vol. 31, 447-453, 2006.
522. Sorokin, V. M., A. K. Yaschenko, V. M. Chmyrev and M. Hayakawa, DC electric field formation in the mid-latitude ionosphere over typhoon and earthquake regions, *Phys. Chem. Earth*, vol. 31, 454-461, 2006.
523. Fedorov, E., A. Ju. Schekotov, O. A. Molchanov, M. Hayakawa, V. V. Surkov and V. A. Gladichev, An energy source for the mid-latitude IAR: World thunderstorm centers, nearby discharges or neutral wind fluctuations?, *Phys. Chem. Earth*, vol. 31, 462-468, 2006.
524. Guglielmi, A., A. Potapov, B. Tsegmed, M. Hayakawa and B. Dovbnaya, On the earthquake effects in the regime of ionospheric Alfvén resonances, *Phys. Chem. Earth*, vol. 31, 469-472, 2006.
525. Hayakawa, M., and S. F. Timashev, An attempt to find precursors in the ULF geomagnetic data by means of flicker noise spectroscopy, *Nonlinear Processes Geophys.*, vol. 13, 255-263, 2006.
526. Ida, Y., and M. Hayakawa, Fractal analysis for the ULF data during the 1993 Guam earthquake to study prefracture criticality, *Nonlinear Processes Geophys.*, vol. 13, 409-412, 2006.
527. Molchanov, O., A. Rozhnoi, M. Solovieva, O. Akentieva, J. J. Berthelier, M. Parrot, F. Lefeuvre, P. F. Biagi, L. Castellana, and M. Hayakawa, Global diagnostics of the ionospheric perturbations related to the seismic activity using the VLF radio signals collected on the DEMETER satellite, *Natural Hazards Earth System Sci.*, vol. 6, 745-753, 2006.
528. Hayakawa, M., F. Yokose, Y. Ida, and D. Iudin, Multi-fractal analysis for thunderstorms leading to the generation of sprites and elves, *J. Atmos. Electr.*, vol. 26, No.2, 51-57, 2006.
529. Hayakawa, M., M. Sekiguchi, Y. Hobara, and A. P. Nickolaenko, Intensity of Schumann resonance oscillations and the ground surface temperature, *J. Atmos. Electr.*, vol. 26, No.2, 79-93, 2006.
530. Nickolaenko, A. P., M. Hayakawa, M. Sekiguchi, Y. Ando, and K. Ohta, Model modifications in Schumann resonance intensity caused by a localized ionosphere disturbance over the earthquake epicenter, *Ann. Geophysicae*, vol. 24, 567-575, 2006.
531. Sekiguchi, M., M. Hayakawa, A. P. Nickolaenko, and Y. Hobara, Evidence on a link between the intensity of Schumann resonance and global surface temperature, *Ann. Geophysicae*, vol. 24, 1809-1817, 2006.

532. Maekawa, S., T. Horie, T. Yamauchi, T. Sawaya, M. Ishikawa, M. Hayakawa, and H. Sasaki, A statistical study on the effect of earthquakes on the ionosphere, based on the subionospheric LF propagation data in Japan, *Ann. Geophysicae*, vol. 24, 2219-2225, 2006.
533. Williams, E., R. Boldi, J. Bor, G. Satori, C. Price, E. Greenberg, Y. Takahashi, K. Yamamoto, Y. Matsudo, Y. Hobara, M. Hayakawa, T. Chronis, E. Anagnostou, D. M. Smith, and L. Lopez, Lightning flashes conducive to the production and escape of gamma radiation to space, *J. Geophys. Res.*, vol. 111, D1629, doi:10.1029/2005JD006447, 2006.
534. 早川正士、服部克己、太田健次、ULF帯磁場変動データを用いた地震関連現象の抽出：レビュー、*電気学会論文誌 A*, vol. 126, No.12, 1238-1244, 2006.
535. Ismaguilov, V. S., Yu. A. Kopytenko, K. Hattori, and M. Hayakawa, Gradients and phase velocities of ULF geomagnetic disturbances used to determine the source of an impending strong earthquake, *Geomagn. Aeronomy*, 46 (3), 423-430, 2006.
536. Hattori, K. and M. Hayakawa, Recent progress and state of the art of seismo-electromagnetics, *IEEJ Trans. Fundamentals and Materials, Special Issue on Technology 2007: Reviews and Forecasts*, vol. 127, 4-6, 2007.
537. Ando, Y., and M. Hayakawa, Use of generalized cross validation for identification of global lightning distribution by using Schumann resonances, *Radio Sci.*, vol. 42, RS2S16, doi.1029/2006RS003481, 2007.
538. Todoroki, Y., S. Maekawa, T. Yamauchi, T. Horie, and M. Hayakawa, Solar flare induced D region perturbation in the ionosphere, as revealed from a short-distance VLF propagation path, *Geophys. Res. Lett.*, vol. 34, L03103, doi:10.1029/2006GL028087, 2007.
539. Sorokin, V. M., A. K. Yaschenko, and M. Hayakawa, A perturbation of DC electric field caused by light ion adhesion to aerosols during the growth in seismic-related atmospheric radioactivity, *Natural Hazards Earth System Sci.*, vol. 7, 155-163, 2007.
540. Yonaiguchi, N., Y. Ida, and M. Hayakawa, On the statistical correlation of over-horizon VHF signals with meteorological radio ducting and seismicity, *J. Atmos. Solar-terr. Phys.*, vol. 69, 661-674, 2007.
541. Yamauchi, T., S. Maekawa, T. Horie, M. Hayakawa, and O. Soloviev, Subionospheric VLF/LF monitoring of ionospheric perturbations for the 2004 Mid-Niigata earthquake and their structure and dynamics, *J. Atmos. Solar-terr. Phys.*, vol. 69, 793-802, 2007.
542. Hayakawa, M., D. I. Iudin, E. A. Mareev, and V. Y. Trakhtengerts, Cellular automaton modeling of mesospheric optical emissions: Sprites, *Physics of Plasmas*, vol. 14, No. 4, pp. 042902 1-6, 2007.
543. Adalev, A. S., M. Hayakawa, N. V. Korovkin, D. I. Iudin, V. Yu. Trakhtengerts, Simulation of surface discharge dynamics by means of cellular automata, *J. Applied Physics*, vol. 101, 083302, 2007.
544. Horie, T., S. Maekawa, T. Yamauchi, and M. Hayakawa, A possible effect of ionospheric perturbations associated with the Sumatra earthquake, as revealed from subionospheric very-low-frequency (VLF) propagation (NWC-Japan), *Int'l J. of Remote Sensing*, vol. 28: 13, 3133-3139, 2007.

545. Hayakawa, M., V. V. Surkov, Y. Fukumoto, and N. Yonaiguchi, Characteristics of VHF over-horizon signals possibly related to impending earthquakes and a mechanism of seismo-atmospheric perturbations, *J. Atmos. Solar-terr. Phys.*, vol. 69, 1057-1062, 2007.
546. Surkov, V. V., and M. Hayakawa, ULF electromagnetic noise due to random variations of background atmospheric current and conductivity, *J. Geophys. Res.*, vol.112, D11116, doi: 10.1029/2006JD007788, 2007.
547. Nickolaenko, A P., and M. Hayakawa, Recent studies of Schumann resonance and ELF transients, *J. Atmos. Electr.*, vol. 27, No. 1, 19-39, 2007.
548. Biagi, P. F., L. Castellana, T. Maggipinto, G. Maggipinto, A. Minafra, A. Ermini, V. Capozzi, G. Perna, M. Solovieva, A. Rozhnoi, O. A. Molchanov, and M. Hayakawa, Decrease in the electric intensity of VLF/LF radio signals and possible connections, *Natural Hazards Earth System Sci.*, vol. 7, 423-430, 2007.
549. Ohta, K., N. Watanabe, and M. Hayakawa, The observation of ultra-low frequency emissions at Nakatsugawa, Japan, in possible association with the Sumatra, Indonesia, earthquake, *Int'l J. Remote Sensing*, vol. 28: 13, 3121-3131, 2007.
550. Horie, T., T. Yamauchi, M. Yoshida, and M. Hayakawa, The wave-like structures of ionospheric perturbation associated with Sumatra earthquake of 26 December 2004, as revealed from VLF observation in Japan of NWC signals, *J. Atmos. Solar-terr. Phys.*, vol. 69, 1021-1028, 2007.
551. Hayakawa, M., and O. A. Molchanov, Seismo-electromagnetics as a new field of radiophysics: Electromagnetic phenomena associated with earthquakes, *Radio Science Bull.*, vol. 320, 8-17, 2007.
552. Hayakawa, M., K. Hattori, and K. Ohta, Monitoring of ULF (ultra-low-frequency) geomagnetic variations associated with earthquakes, *Sensors*, vol. 7, 1108-1122, 2007.
553. Hayakawa, M., VLF/LF radio sounding of ionospheric perturbations associated with earthquakes, *Sensors*, vol. 7, 1141-1158, 2007.
554. Korovkin, N. V., V. L. Chechurin, and M. Hayakawa, Development of optimization methods for improvement of electromagnetic devices, *IEEJ Transactions on Electrical and Electronic Engineering*, vol. 2, No. 4, 413-423, 2007.
555. Matsudo, Yu, T. Suzuki, M. Hayakawa, K. Yamashita, Y. Ando, K. Michimoto, and V. Korepanov, Characteristics of Japanese winter sprites and their parent lightning as estimated by VHF lightning and ELF transients, *J. Atmos. Solar-terr. Phys.*, vol. 69, 1431-1446, 2007.
556. Nickolaenko, A. P., and M. Hayakawa, Diurnal variations in Schumann resonance intensity in the local and universal times, *J. Atmos. Electr.*, vol. 27, 83-93, 2007.
557. Hayakawa, M., T. Suzuki, T. Nakamura, K. Michimoto, and D. Iudin, Fractal analysis of radar images of Japanese winter thunderclouds inducing sprites and its comparison with their corresponding life cycle, *J. Atmos. Electr.*, vol. 27, 113-121, 2007.
558. Ida, Y., M. Hayakawa, and S. Timashev, Application of different signal analysis methods to the ULF data for the 1993 Guam earthquake, *Natural Hazards Earth System Sci.*, vol. 7, 479-484, 2007.

559. Yonaiguchi, N., Y. Ida, M. Hayakawa, and S. Masuda, A comparison of different fractal analyses for VHF electromagnetic emissions and their self-organization for the off-sea Miyagi-prefecture earthquake, *Natural Hazards Earth System Sci.*, vol. 7, 485–493, 2007.
560. Rozhnoi, A., O. Molchanov, M. Solovieva, V. Gladyshev, O. Akentieva, J. J. Berthelier, M. Parrot, F. Lefeuvre, M. Hayakawa, L. Castellana, and P. F. Biagi, Possible seismo-ionosphere perturbations revealed by VLF signals collected on ground and on a satellite, *Natural Hazards Earth System Sci.*, vol. 7, 617–624, 2007.
561. Yonaiguchi, N., Y. Ida, M. Hayakawa, and S. Masuda, Fractal analysis for VHF electromagnetic noises and the identification of preseismic signature of an earthquake, *J. Atmos. Solar-terr. Phys.*, vol. 69, 1825–1832, 2007.
562. Smirnova, N. A., and M. Hayakawa, Fractal characteristics of the ground-observed ULF emissions in relation to geomagnetic and seismic activities, *J. Atmos. Solar-terr. Phys.*, vol. 69, 1833–1841, 2007.
563. Rozhnoi, A., M. Solovieva, O. Molchanov, P.-F. Biagi, and M. Hayakawa, Observation evidences of atmospheric gravity waves induced by seismic activity from analysis of subionospheric LF signal spectra, *Natural Hazards Earth System Sci.*, vol. 7, 625–628, 2007.
564. Sorokin, V. M., A. K. Yashchenko, and M. Hayakawa, Electric field perturbation caused by an increase in conductivity related to seismicity-induced atmospheric radioactivity growth, *Russian J. Physical Chemistry B*, vol. 1, 644–648, 2007.
565. Schekotov, A. Y., O. A. Molchanov, M. Hayakawa, E. N. Fedorov, V. N. Chebrov, V. I. Sinitin, E. E. Gordeev, G. G. Belyaev, and N. V. Yagova, ULF/ELF magnetic field variations from atmosphere induced by seismicity, *Radio Sci.*, vol. 42, RS6S90, doi:10.1029/2005RS003441, 2007.
566. Bezrodny, V., O. Budanov, A. Koloskov, M. Hayakawa, V. Sinitin, Y. Yampolski, and V. Korepanov, The ELF band as a possible spectral window for seismo-ionospheric diagnostics, *Sun and Geosphere*, vol. 2, 88–95, 2007.
567. 吉田麻里, 山内健, 堀江匠, 早川正士, Wave-hop 法を用いた VLF/LF 帯電波伝搬解析による Terminator Time の発生機構に関する考察, *電子情報通信学会論文誌 B*, vol. J91-B, No. 1, 70–78, 2008.
568. Suzuki, T., K. Kusunoki, K. Hattori, and M. Hayakawa, Recent developments in portable weather radars and new experiments, *Inst. Electr. Engrs. Japan, Trans. Fundamentals and Materials*, vol. 128, No. 1, 2–4, 2008.
569. Hayakawa, M., K. Ohta, and N. Watanabe, Anomalous Schumann resonance phenomena observed in Japan, in possible association with earthquakes in Taiwan, in “Electromagnetic Phenomenon Related to Earthquakes and Volcanoes”, Ed. by B. Singh, Narosa Pub. House, 1–6, 2008.
570. Ohta, K., N. Watanabe, and M. Hayakawa, Electromagnetic precursors to the Indonesia Sumatra earthquake, in “Electromagnetic Phenomenon Related to Earthquakes and Volcanoes”, Ed. by B. Singh, Narosa Pub. House, 7–14, 2008.
571. Horie, T., S. Maekawa, T. Yamauchi, and M. Hayakawa, Characteristics and dynamics of ionospheric perturbations associated with the 2004 Sumatra earthquake, as revealed from subionospheric VLF propagation (NWC-Japan), in “Electromagnetic Phenomenon Related to Earthquakes and Volcanoes”, Ed. by B. Singh, Narosa Pub. House, 84–95, 2008.

572. Muto, F., M. Yoshida, T. Horie, M. Hayakawa, M. Parrot, and O. A. Molchanov, Detection of ionospheric perturbations associated with Japanese earthquakes on the basis of reception of LF transmitter signals on the satellite DEMETER, *Natural Hazards Earth System Sci.*, vol. 8, 135–141, 2008.
573. Yoshida, M., T. Yamauchi, T. Horie, and M. Hayakawa, On the generation mechanism of terminator times in subionospheric VLF/LF propagation and its possible application to seismogenic effects, *Natural Hazards Earth System Sci.*, vol. 8, 129–134, 2008.
574. Sekiguchi, M., Y. Hobara, and M. Hayakawa, Diurnal and seasonal variations in the Schumann resonance parameters at Moshiri, Japan, *J. Atmos. Electr.*, vol. 28, 1-10, 2008.
575. Asano, T., M. Hayakawa, M. Cho, and T. Suzuki, Computer simulations on the initiation and morphological difference of Japan winter and summer sprites, *J. Geophys. Res.*, vol. 113, A02308, doi:10.1029/2007JA012528, 2008.
576. Hayakawa, M., D. Katz, and N. Blaunstein, Signal power distribution in time delay in Tokyo City experimental sites, *Radio Sci.*, vol. 43, RS3006, doi:10.1029/2007RS003748, 2008.
577. Nickolaenko, A. P., and M. Hayakawa, Universal and local time components in Schumann resonance intensity, *Ann. Geophysicae*, vol. 26, 813–822, 2008.
578. Sorokin, V. M., and M. Hayakawa, On the generation of narrow-banded ULF/ELF pulsations in the lower ionospheric conducting layer, *J. Geophys. Res.*, vol. 113, A06306, doi:10.1029/2008JA013094, 2008.
579. Nickolaenko, A. P., and M. Hayakawa, Comment on “Sprite lightning heard round the world by Schumann resonance methods” by E. R. Williams, V. C. Mushtak, R. Boldi, R. L. Dowden, and Z.-I. Kawasaki, *Radio Sci.*, vol. 43, RS3007, doi:10.1029/2007RS003737, 2008.
580. Adalev, S. A., N. V. Korovkin, and M. Hayakawa, Using linear relations between experimental characteristics in stiff identification problems of linear circuit theory, *IEEE Trans. Circuits and Systems*, vol. 55, No. 5, 1237-1247, 2008.
581. Kasahara, Y., F. Muto, T. Horie, M. Yoshida, M. Hayakawa, K. Ohta, A. Rozhnoi, M. Solovieva, and O. A. Molchanov, On the statistical correlation between the ionospheric perturbations as detected by subionospheric VLF/LF propagation anomalies and earthquakes, *Natural Hazards Earth System Sci.*, vol. 8, 653–656, 2008.
582. Hobara, Y., S. N. Walker, M. Balikhin, O. A. Pokhotelov, M. Gedalin, V. Krasnoselskikh, M. Hayakawa, M. André, M. Dunlop, H. Rème, and A. Fazakerley, Cluster observations of electrostatic solitary waves near the Earth’s bow shock, *J. Geophys. Res.*, vol. 113, A05211, doi:10.1029/2007JA012789, 2008.
583. Tanaka, Y. T., T. Terasawa, M. Yoshida, T. Horie, and M. Hayakawa, Ionospheric disturbances caused by SGR 1900+14 giant gamma ray flare in 1998: Constraints on the energy spectrum of the flare, *J. Geophys. Res.*, vol. 113, A07307, doi:10.1029/2008JA013119, 2008.
584. Korovkin, N. V., E. B. Solovyeva, and M. Hayakawa, Synthesis of polynomial compensators for suppression of low-frequency noise in electronic devices, *IEEJ Trans. Electronics, Information and Systems*, vol. 128, No. 7, 1197-1203, 2008.

585. Ida, Y., D. Yang, Q. Li, H. Sun, and M. Hayakawa, Detection of ULF electromagnetic emissions as a precursor to an earthquake in China with an improved polarization analysis, *Natural Hazards Earth System Sci.*, vol. 8, 775–777, 2008.
586. Nagamoto, H., T. Fukushima, Y. Ida, Y. Matsudo, and M. Hayakawa, Disturbances in VHF/UHF telemetry links as a possible effect of the 2003 Hokkaido Tokachi-oki earthquake, *Natural Hazards Earth System Sci.*, vol. 8, 813–817, 2008.
587. Bashkuev, Y. B., V. R. Advokatov, L. K. Angarkhaeva, V. S. Dorzhiev, and M. Hayakawa, Maps of geoelectric sections of Turkey, Iran, Afghanistan, Pakistan, Korea, and Japan, *Natural Hazards Earth System Sci.*, vol. 8, 861–868, 2008.
588. 井筒潤, 太田健次, 畑雅恭, 渡辺伸夫, 石野博一, 早川正士, 巨大地震に伴う Schumann 共振の異常励起, *J. Atmos. Electr.*, vol. 28, No. 2, 87-99, 2008.
589. Nickolaenko, A. P., M. Hayakawa, T. Ogawa, and M. Komatsu, Q-bursts: A comparison of experimental and computed ELF waveforms, *Radio Sci.*, vol. 43, RS4014, doi:10.1029/2008RS003838, 2008.
590. Hayakawa, M., D. I. Iudin, and V. Y. Trakhtengerts, Modeling of thundercloud VHF/UHF radiation on the lightning preliminary breakdown stage, *J. Atmos. Solar-terr. Phys.*, vol. 70, 1660-1668, 2008.
591. Hayakawa, M., and Y. Ida, Fractal (mono- and multi-) analysis for the ULF data during the 1993 Guam earthquake for the study of prefracture criticality, *Current Development in Theory and Applications of Wavelets*, vol. 2(2), 159-174, 2008.
592. Biagi, P. F., L. Castellana, T. Maggipinto, D. Loiacono, V. Augelli, L. Schiavulli, A. Ermini, V. Capozzi, M. S. Solovieva, A. A. Rozhnoi, O. A. Molchanov, and M. Hayakawa, Disturbances in a VLF radio signal prior the M=4.7 offshore Anzio (central Italy) earthquake on 22 August 2005, *Natural Hazards Earth System Sci.*, vol. 8, 1041-1048, 2008.
593. Rozhnoi, A., M. Solovieva, O. Molchanov, O. Akentieva, J. J. Berthelier, M. Parrot, P. F. Biagi, and M. Hayakawa, Statistical correlation of spectral broadening in VLF transmitter signal and low-frequency ionospheric turbulence from observation on DEMETER satellite, *Natural Hazards Earth System Sci.*, vol. 8, 1105–1111, 2008.
594. Surkov, V. V., and M. Hayakawa, Natural electromagnetic ULF noise due to fluctuations of ionospheric currents, *J. Geophys. Res.*, vol. 113, A11310, doi:10.1029/2008JA013196, 2008. (Correction, *JGR*, vol. 114, A03302, doi:10.1029/2009JA014095)
595. Schekotov, A. Y., O. A. Molchanov, M. Hayakawa, E. N. Fedorov, V. N. Chebrov, V. I. Sinitsin, E. E. Gordeev, S. E. Andreevsky, G. G. Belyaev, N. V. Yagova, V. A. Gladishev, and L. N. Baransky, About possibility to locate an EQ epicenter using parameters of ELF/ULF preseismic emission, *Natural Hazards Earth System Sci.*, vol. 8, 1237–1242, 2008.
596. Hayakawa, M., A. P. Nickolaenko, M. Sekiguchi, K. Yamashita, Y. Ida, and M. Yano, Anomalous ELF phenomena in the Schumann resonance band as observed at Moshiri (Japan) in possible association with an earthquake in Taiwan, *Natural Hazards Earth System Sci.*, vol. 8, 1309-1316, 2008.
597. Hayakawa, M., T. Horie, M. Yoshida, Y. Kasahara, F. Muto, K. Ohta, and T. Nakamura, On the ionospheric perturbation associated with the 2007 Niigata Chuetsu-oki earthquake, as seen from subionospheric VLF/LF network observations, *Natural Hazards Earth System Sci.*, vol. 8, 573-576, 2008.

598. Nickolaenko, A. P., M. Hayakawa, M. Sekiguchi, and Y. Hobara, Comparison of the variations in the intensity of global electromagnetic resonance and ground surface temperature, *Radiophysics and Quantum Electronics*, vol. 51, No. 12, 931-945, 2008.
599. Ando, Y., H. Saito and M. Hayakawa, A nearly perfect Total-Field/Scattered-Field boundary for the one-dimensional CIP method, *IEICE Trans. Electron.*, vol. E91-C-10, 1677-1683, 2008.
600. Nickolaenko, A. P. and M. Hayakawa, Comment on "Sprite lightning heard round the world by Schumann resonance methods" by E. R. Williams, V. C. Mushtak, R. Boldi, R. L. Downden, and Z.-I. Kawasaki, *Radio Sci.*, vol. 43, RS3007, doi:10.1029/2007RS003737, 2008.
601. 早川正士、地震に伴う電磁気現象の衛星観測、特集 宇宙・航空からの災害監視、計測と制御、vol.47, No.12, 1028-1032, 2008.
602. Matsudo, Y., T.Suzuki, K.Michimoto, K.Myokei, and M.Hayakawa, Comparison of time delays of sprites induced by winter lightning flashes in the Japan Sea with those in the Pacific Ocean, *J. Atmos. Solar-terr. Phys.*, vol. 71, 101-111, 2009.
603. Asano, T., T. Suzuki, Y. Hiraki, E. Mareev, M. G. Cho, and M. Hayakawa, Computer simulations on sprite initiation for realistic lightning models with higher-frequency surges, *J. Geophys. Res.*, vol. 114, A02310, doi: 10.1029/2008JA013651, 2009.
604. Myokei, K., Y. Matsudo, T. Asano, M. Sekiguchi, T. Suzuki, T. Hobara, and M. Hayakawa, Morphology of winter sprites in the Hokuriku area on Japan: Monthly variation and dependence on air temperature, *J. Atmos. Electr.*, vol.29, No.1, 23-34, 2009.
605. 早川正士, VLF/ELF 空電の方位測定法 : レビュー, *J. Atmos. Electr.*, vol. 29, No. 1, 35-52, 2009.
606. Yasuda, Y., Y. Ida, T. Goto, and M. Hayakawa, Interferometric direction finding of over-horizon VHF transmitter signals and natural VHF radio emissions possibly associated with earthquakes, *Radio Sci.*, vol. 44, RS2009, doi:10.1029/2008RS003884, 2009.
607. Myokei, K., Y. Matsudo, T. Asano, T. Suzuki, Y. Hobara, K. Michimoto, and M. Hayakawa, A study of the morphology of winter sprites in the Hokuriku area of Japan in relation to cloud charge height, *J. Atmos. Solar-terr. Phys.*, vol. 71, 597-602, 2009.
608. Kudintseva, I. G., A. P. Nickolaenko, and M. Hayakawa, Spatial fine structure of model electric pulses in the mesosphere above a Γ -shaped stroke of lightning, *J. Atmos. Solar-terr. Phys.*, vol. 71, 603-608, 2009.
609. Saroso, S., K. Hattori, H. Ishikawa, Y. Ida, R. Shirogane, M. Hayakawa, K. Yumoto, K. Shiokawa, and M. Nishihashi, ULF geomagnetic anomalous changes possibly associated with 2004-2005 Sumatra earthquakes, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 343-349, 2009.
610. Yumoto, K., S. Ikemoto, M. G. Cardinal, M. Hayakawa, K. Hattori, J. Y. Liu, S. Saroso, M. Ruhimat, M. Husni, D. Widarto, E. Ramos, D. McNamara, R. E. Otadoy, G. Yumul, R. Eborra, and N. Servando, A new ULF wave analysis for Seismo-Electromagnetics using CPMN/MAGDAS data, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 360-366, 2009.

611. Ohta, K., J. Izutsu, and M. Hayakawa, Anomalous excitation of Schumann resonances and additional anomalous resonances before the 2004 Mid-Niigata prefecture earthquake and the 2007 Noto Hantou earthquake, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 441-448, 2009.
612. Muto, F., T. Horie, M. Yoshida, M. Hayakawa, A. Rozhnoi, M. Solovieva, and O. A. Molchanov, Ionospheric perturbations related to the Miyagi-oki earthquake on 16 August 2005, as seen from Japanese VLF/LF subionospheric propagation network, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 449-455, 2009.
613. Biagi, P. F., L. Castellana, T. Maggipinto, G. Maggipinto, A. Minafra, A. Ermini, O. Molchanov, A. Rozhnoi, M. Solovieva, and M. Hayakawa, Anomalies in VLF radio signals related to the seismicity during November-December 2004: A comparison of ground and satellite results, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 456-463, 2009.
614. Korepanov, V., M. Hayakawa, Y. Yampolski, and G. Lizunov, AGW as a seismo-ionospheric coupling responsible agent, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 485-495, 2009.
615. Blaunstein, N., and M. Hayakawa, Short-term ionospheric precursors of earthquakes using vertical and oblique ionosondes, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 496-507, 2009.
616. Rapoport, Yu. G., M. Hayakawa, O. E. Gotynyan, V. N. Ivchenko, A. K. Fedorenko, and Yu. A. Selivanov, Stable and unstable plasma perturbations in the ionospheric F region, caused by spatial packet of atmospheric gravity waves, *Phys. Chem. Earth, Parts A/B/C*, vol. 34, Issues 6-7, Special issue, *Electromagnetic Phenomena Associated with Earthquakes and Volcanoes*, Edited by M. Hayakawa, J. Y. Liu, K. Hattori, and L. Telesca, 508-515, 2009.
617. Asano, T., T. Suzuki, M. Hayakawa, and M. G. Cho, Three-dimensional EM computer simulation on sprite initiation above a horizontal lightning discharge, *J. Atmos. Solar-terr. Phys.*, vol. 71, 983-990, 2009.
618. Mezentsev, A. Yu., and M. Hayakawa, Maximal radius of the aftershock zone in earthquake networks, *Physica A*, vol. 388, 3621-3628, 2009.
619. Muto, F., Y. Kasahara, Y. Hobara, M. Hayakawa, A. Rozhnoi, M. Solovieva, and O. A. Molchanov, Further study on the role of atmospheric gravity waves on the seismo-ionospheric perturbations as detected by subionospheric VLF/LF propagation, *Natural Hazards Earth System Sci.*, 9, 1111-1118, 2009.
620. Shvets, A.V., M. Hayakawa, M. Sekiguchi, and Y. Ando, Reconstruction of the global lightning distribution from ELF electromagnetic background signals, *J. Atmos. Solar-terr. Phys.*, vol. 71, 1405-1412, 2009.
621. Yamashita, K., T. Otsuyama, Y. Hobara, M. Sekiguchi, Y. Matsudo, M. Hayakawa, and V. Korepanov, Global distribution and characteristics of intense lightning discharges as deduced from ELF transients observed at Moshiri(Japan), *J. Atmos. Electr.*, vol.29, No.2, 71-80, 2009.

622. Mezentsev, A. Yu., M. Hayakawa and K. Hattori, Fractal ULF signatures related to seismic processes, *J. Atmos. Electr.*, vol.29, No.2, 81-93, 2009.
623. Rozhnoi, A., M. Solovieva, O. Molchanov, K. Schwingenschuh, M. Boudjada, P.F. Biagi, T. Maggipinto, L. Castellana, A. Ermini, and M. Hayakawa, Anomalies in VLF radio signals prior to the Abrusso earthquake(M=6.3) on 6 April 2009, *Natural Hazards Earth System Sci.*, vol. 9, 1727-1732, 2009.
624. Hayakawa, M., Y. Sue, and T. Nakamura, The effect of earth tides as observed in seismo-electromagnetic precursory signals, *Natural Hazards Earth System Sci.*, vol. 9, 1733-1741, 2009.
625. Hayakawa, M., Seismogenic perturbation in the atmosphere, "Electromagnetic Phenomena Associated with Earthquakes" Ed. by M. Hayakawa, Transworld Research Network, Trivandrum(India), Chapter 5(119-136), 2009.
626. Hayakawa, M., Lower ionospheric perturbations associated with earthquakes, as detected by subionospheric VLF/LF radio waves, "Electromagnetic Phenomena Associated with Earthquakes" Ed. by M. Hayakawa, Transworld Research Network, Trivandrum(India), Chapter 6(137-185), 2009.
627. Izutsu, J., K. Ohta, and M. Hayakawa, The direction finding of ULF emissions observed before the 2007 Noto Hantou and the 2008 Iwate-Miyagi Nairiku earthquakes, *Inst. Electr. Engrs. Japan, Trans. Fundamentals and Materials, Special Issue on Electromagnetic technologies for forecasting and monitoring natural hazards*, vol. 129, No. 12, 865-869, 2009.
628. Asano, T., T. Suzuki, Y. Hiraki, E. Mareev, M. G. Cho, and M. Hayakawa, Reply to comment by L.Z.S. Campos and M. M. F. Saba on "Computer simulations on sprite initiation for realistic lightning models with higher-frequency surges", *J. Geophys. Res.*, vol. 114, A12325, doi:10.1029/2009JA014464, 2009.
629. Katz, D., N. Blaunstein, M. Hayakawa, and Y. Sanoh Kishiki, The design of radio maps in Tokyo city based on stochastic multi-parametric and deterministic ray-tracing approaches, *IEEE Antennas and Propagation Magazine*, vol. 51, No. 5, 200-208, 2009.
630. Williams, E., W. Lyons, Y. Hobara, V. Mushtak, N. Asencio, R. Boldi, J. Bor, S. Cummer, E. Greenberg, M. Hayakawa, R. Holzworth, V. Kotroni, J. Li, C. Morales, T. Nelson, C. Price, B. Russell, G. Satori, K. Shirahata, Y. Takahashi, K. Yamashita, Ground-Based Detection of Sprites and their Parent Lightning Flashed over Africa during the 2006 AMMA Campaign, Special Issue in the Quarterly Journal of the Royal Meteorological Society, *Q. J. Roy. Meteorol. Soc.*, vol. 136 (s1), 257-271, DOI: 10.1002/qj.489, 2010.
631. Yano, M., Y. Ida, Y. Hobara, M. Hayakawa, and A.P. Nickolaenko, Reception of ELF transmitter signals at Moshiri, Japan, and their propagation characteristics, *Radio Sci.*, vol. 45, RS1009, doi: 10.1029/2009RS004224, 2010.
632. Surkov, V.V., and M. Hayakawa, Schumann resonances excitation due to positive and negative cloud-to-ground lightning, *J. Geophys. Res.*, vol. 115, D04101, doi:10.1029/2009JD012539, 2010.
633. Nickolaenko, A. P., and M. Hayakawa, Model disturbance of Schumann resonance by the SGR 1806-20 γ -ray flare on December 27, 2004, *J. Atmos. Electr.*, vol.30, No.1, 1-11, 2010.

634. Hayakawa, M., T. Horie, F. Muto, Y. Kasahara, K. Ohta, J. Y. Liu, and Y. Hobara, Subionospheric VLF/LF probing of ionospheric perturbations associated with earthquakes: A possibility of earthquake prediction, *SICE J. Control, Measurement, and System Integration (SICE JCMSI)*, vol. 3, No. 1, 10-14, 2010.
635. Rozhnoi, A., M. Solovieva, O. Molchanov, P.F. Biagi, M. Hayakawa, K. Schwingenschuh, M. Boudjada, and M. Parrot, Variations of VLF/LF signals observed on the ground and satellite during a seismic activity in Japan region in May-June 2008, *Natural Hazards Earth System Sci.*, vol. 10, 529-534, 2010.
636. Kasahara, Y., F. Muto, Y. Hobara, and M. Hayakawa, The ionospheric perturbations associated with Asian earthquakes as seen from the subionospheric propagation from NWC to Japanese stations, *Natural Hazards Earth System Sci.*, vol. 10, 581-588, 2010.
637. Surkov, V.V., Y. Matsudo, M. Hayakawa, and S.V. Goncharov, Estimation of lightning and sprite parameters based on observation of sprite-producing lightning power spectra, *J. Atmos. Solar-terr. Phys.*, vol. 72, 448-456, 2010.
638. Imamura, T., Y. Ida, Y. Kasahara, T. Nakamura, Y. Hobara, and M. Hayakawa, Fractal analysis of subionospheric LF propagation data and consideration of the lithosphere-atmosphere-ionosphere coupling, *Natural Hazards Earth System Sci.*, vol. 10, 901-906, 2010.
639. Hayakawa, M., Seismo Electromagnetics as a frontier of Radio Science, Special Issue devoted to the 90th birthday of Prof. Ya. S. Shifrin and his scientific achievements, *Applied Radio-Electronics (Ukraine)*, vol. 9, No. 1, 35-60, 2010.
640. Hayakawa, M., and Y. Hobara., Current status of seismo-electromagnetics for short-term earthquake prediction, *Geomatics, Natural Hazards and Risk*, vol. 1, no. 2, 115-155, 2010.
641. Hayakawa, M., Y. Kasahara, T. Nakamura, Y. Hobara, A. Rozhnoi, M. Solovieva, and O. A. Molchanov, On the correlation between ionospheric perturbations as detected by subionospheric VLF/LF signals and earthquakes as characterized by seismic intensity, *J. Atmos. Solar-terr. Phys.*, vol. 72, 982-987, 2010.
642. Nakamura, T., M. Sekiguchi, Y. Hobara, and M. Hayakawa, A comparison of different source location methods for ELF transients by using the parent lightning discharges with known positions, *J. Geophys. Res.*, vol. 115, A00E39, doi:10.1029/2009JA014992, 2010.
643. Nickolaenko, A. P., M. Hayakawa, and Y. Hobara, Q-bursts: Natural ELF radio transients, *Survey Geophys.*, vol. 31, 409-425, DOI 10.1007/s10712-0010-9096-9, 2010.
644. Kudintseva, I. G., A. P., Nickolaenko, and M. Hayakawa, Transient electric field in the mesosphere above a Γ -shape lightning stroke, *Survey Geophys.*, vol. 31, 427-448, DOI 10.1007/s10712-0010-9095-x, 2010.
645. Kasahara, Y., T. Nakamura, Y. Hobara, M. Hayakawa, A. Rozhnoi, M. Solovieva, and O. A., Molchanov, A statistical study on the AGW modulation in subionospheric VLF/LF propagation data and consideration of the generation mechanism of seismo-ionospheric perturbations, *J. Atmos. Electr.*, vol.30, No.2, 103-112, 2010.
646. Blaunstein, N., D. Katz, and M. Hayakawa, Spectral properties of modulated signals in the Doppler domain in urban radio channels with fading, *IEEE Trans. Ant. Prop.*, vol. 58(8), 2795-2800, 2010.

647. Tanaka, Y. T., J. P. Raulin, F. C. P. Bertoni, P. R. Fagundes, J. Chau, N. J. Schuch, M. Hayakawa, Y. Hobara, T. Terasawa, and T. Takahashi, First very low frequency detection of short repeated bursts from magnetar SGR J1550-5418, *Astrophys. J. Letters*, vol. 721, L24-L27, 2010.
648. Hayakawa, M., Y. Kasahara, T. Nakamura, F. Muto, T. Horie, S. Maekawa, Y. Hobara, A. A., Rozhnoi, M. Solovieva, and O. A. Molchanov, A statistical study on the correlation between lower ionospheric perturbations as seen by subionospheric VLF/LF propagation and earthquakes, *J. Geophys. Res.*, vol. 115, A09305, doi:10. 1029/2009JA015143, 2010.
649. Hayakawa, M., K. Ohta, V. M. Sorokin, A. K. Yaschenko, J. Izutsu, Y. Hobara, and A. P. Nickolaenko, Interpretation in terms of gyrotropic waves of Schumann-resonance-like line emissions observed at Nakatsugawa in possible association with nearby Japanese earthquakes, *J. Atmos. Solar-terr. Phys.*, vol. 72, 1292-1298, 2010.
650. Hayakawa, M., The use of subionospheric VLF/LF propagation for the study of lower ionospheric perturbations associated with earthquakes, in "Propagation effects of Very Low Frequency Radio Waves", Ed. by S. K. Chakrabarti, American Inst. Physics, AIP conference Proceedings, Vol. 1286, 223-269, 2010.
651. Hobara, Y., M. Hayakawa, H. Fuji, and K. Ohta, VLF subionospheric disturbances and ELF transients associated with TLEs; Observations and modeling, in "Propagation effects of Very Low Frequency Radio Waves", Ed. by S. K. Chakrabarti, American Inst. Physics, AIP conference Proceedings, Vol. 1286, 158-176, 2010.
652. 早川正士, 芳原容英, 地球周辺での電磁ノイズの計測と地球環境の監視, , 電子情報通信学会 論文誌 B, 招待論文, vol. 93-B, No.11, 1495-1503, 2010.
653. Blaunstein, N., Y. Cohen, and M. Hayakawa, Prediction of fading phenomena in land-satellite communication links, *Radio Sci.*, vol. 45, RS6005, doi:10.1029/2010RS004352, 2010.
654. Shvets, A. V., Y. Hobara, and M. Hayakawa, Variations of the global lightning distribution revealed from three-station Schumann resonance measurements, *J. Geophys. Res.*, vol. 115, A12316, doi:10. 1029/2010JA015851, 2010.
655. Nickolaenko, A. P., M. Hayakawa, T. Ogawa, and M. Komatsu, Comparison of observed and model waveforms of Q-bursts, *Telecomm. Radio Eng.*, vol. 69, no. 19, 1735-1750, 2010.
656. Sue, Y., and Hayakawa, M., An approach to the validation of thermal and electromagnetic earthquake precursors: Effects of earth tides, *Journal of Asian Earth Sciences*, vol. 41, 428-433, 2011.
657. Asai, S., S. Yamamoto, Y. Kasahara, Y. Hobara, T. Inaba, and M. Hayakawa, Measurement of Doppler shifts of short-distance subionospheric LF transmitter signals and seismic effects, *J. Geophys. Res.*, doi:10.1029/2010JA016055, 2011.
658. Hayakawa, M., On the fluctuation spectra of seismo-electromagnetic phenomena, *Natural Hazards Earth System Sci.*, vol. 11, 301-308, 2011.
659. Hayakawa, M., J. P. Raulin, Y. Kasahara, F. C. P. Bertoni, Y. Hobara, and W. Guevara-Day, Ionospheric perturbations in possible association with the 2010 Haiti earthquake, as based on medium-distance subionospheric VLF propagation data, *Natural Hazards Earth System Sci.*, vol. 11, 513-518, 2011.

660. Sorokin, V. M., Yu. Ya. Ruzhin, A. K. Yaschenko, and M. Hayakawa, Generation of VHF radio emissions by electric discharges in the lower atmosphere over a seismic region, *J. Atmos. Solar-terr. Phys.*, vol. 73, 664-670, 2011.
661. Hayakawa, M., A. P. Nickolaenko, A. V. Shvets, and Y. Hobara, Recent studies of Schumann resonance and ELF transients, in "Lightning: Properties, Formation and Types", Ed. by M. D. Wood, Nova Sci. Pub., Chapter 3 (39-71), 2011.
662. Tanaka, Y. T., M. Hayakawa, Y. Hobara, A. P. Nickolaenko, K. Yamashita, M. Sato, Y. Takahashi, T. Terasawa, and T. Takahashi, Detection of transient ELF emission caused by the extremely intense cosmic gamma-ray flare of 27 December 2004, *Geophys. Res. Lett.*, vol.38, L08805, doi:10.1029/2011GL047008, 2011.
663. Suzuki, T., Y. Matsudo, T. Asano, M. Hayakawa, and K. Michimoto, Meteorological and electrical aspects of several winter thunderstorms with sprites in the Hokuriku area of Japan, *J. Geophys. Res.*, vol.116, D06205, doi:10.1029/2009JD013358, 2011.
664. Nickolaenko, A. P., I. G. Kudintseva, O. Pechonaya, M. Hayakawa, T. Nakamura, Y. Hobara, and Y. Tanaka, Impact of a gamma-ray burst on the Schumann resonance, *Radiophysics and Quantum Electronics*, vol.53, 542-556, 2011.
665. Nickolaenko, A. P., E. I. Yatsevich, A. V. Shvets, M. Hayakawa, and Y. Hobara, Schumann-resonance records at three observatories and ULF universal- and local-time variations, *Radiophysics and Quantum Electronics*, vol.53, 706-716, 2011.
666. Schwingenschuh, K., G. Prattes, B. P. Besser, K. Močnik, M. Stachel, Ö. Aydogar, I. Jernej, M. Y. Boudjada, G. Stangl, A. Rozhnoi, M. Solovieva, P. F. Biagi, M. Hayakawa, and H. U. Eichelberger, The Graz seismo-electromagnetic VLF facility, *Natural Hazards Earth System Sci.*, vol.11, 1121-1127, 2011.
667. Miyazaki, T., K. Michimoto, T. Suzuki, T. Okada, K. Kusunoki, M. Hayakawa, J. Kimura, and S. Hayakawa, Percentage of summer positive & negative lightning discharges and lightning current at the dissipating stage, *J. Atmos. Electr.*, vol.31, No.2, 71-83, 2011.
668. Hobara, Y., T. Harada, K. Ohta, M. Sekiguchi, and M. Hayakawa, A study on global temperature and thunderstorm activity by using the data of Schumann resonance observed at Nakatsugawa, Japan, *J. Atmos. Electr.*, vol.31, No.2, 111-119, 2011.
669. Hayakawa, M., Y. Kasahara, T. Nakamura, Y. Hobara, A. Rozhnoi, M. Solovieva, O. A. Molchanov, and V. Korepanov, Atmospheric gravity waves as a possible candidate for seismo-ionospheric perturbations, *J. Atmos. Electr.*, vol.31, No.2, 129-140, 2011.
670. 伊藤仁、安藤芳晃、早川正士、VLF帯大地—電離層導波管伝搬の簡易FDTD解析法、*電気学会論文誌A*, vol. 131, No. 9, 744-749, 2011.
671. Nickolaenko, A. P., E. I. Yatsevich, A. V. Shvets, M. Hayakawa, and Y. Hobara, Universal and local time variations deduced from simultaneous Schumann resonance records at three widely separated observatories, *Radio Sci.*, vol. 46, RS5003, doi:10.1029/2011RS004663, 2011.
672. Hayakawa, M., Y. Hobara, K. Ohta, J. Izutsu, A. P. Nickolaenko, and V. M. Sorokin, Seismogenic Effects in the ELF Schumann Resonance Band, *Inst. Electr. Engrs. Japan (IEEJ), Trans. Fundamentals and Materials*, vol. 131, No. 9, 684-690, 2011.
673. Shvets, A., and M. Hayakawa, Global lightning activity on the basis of inversions of natural ELF electromagnetic data observed at multiple stations around the world, *Survey Geophys.*, vol. 32, issue 6, 705-732, DOI 10.1007/s10712-011-9135-1, 2011.

674. Suzuki, T., M. Hayakawa, and K. Michimoto, Small winter thunderstorm with sprites and strong positive discharge, *Inst. Electr. Engrs. Japan (IEEJ), Trans. Fundamentals and Materials*, vol. 131, No. 9, 723-728, 2011.
675. Hayakawa, M., N. Yonaiguchi, Y. Ida, S. Masuda, and Y. Hobara, Fractal analysis of electromagnetic emissions in possible association with earthquakes, in “Classification and Applications of Fractals”, Ed. by W. L. Hagen, 83-101, 2011.
676. Hayakawa, M., Y. Hobara, K. Ohta, and K. Hattori, The ultra-low-frequency magnetic disturbances associated with earthquakes, *Earthquake Science*, vol.24, No.6, 523-534, 2011.
677. Hayakawa, M., Probing the lower ionospheric perturbations associated with earthquakes by means of subionospheric VLF/LF propagation, *Earthquake Science*, vol.24, No.6, 609-637, 2011.
678. Yatsevich, E. I., A. P. Nickolaenko, A. V. Shvets, M. Hayakawa, and Y. Hobara, Schumann-resonance records at three observatories and ULF universal- and local-time variations, *Radiophysics and Quantum Electronics*, vol. 53, no. 12, 706-716, doi:10.1007/s11141-011-9263-y, 2011.
679. Grimalsky, V. V., M. A. Cruz Chavez, S. V. Koshevaya, A. Kotsarenko, M. Hayakawa, and R. Pérez Enriquez, Simulation of waves processes in dusty emission of volcano, *Open Journal of Geology*, vol. 1, 10-16, 2011.
680. Kopytenko, Yu. A., V. S. Ismaguilov, K. Hattori, and M. Hayakawa, Anomaly disturbances of magnetic fields before the strongest earthquake in Japan on March 11, 2011, in “The Frontier of Earthquake Prediction Studies”, Ed. by M. Hayakawa, Nihon-senmontosho-Shuppan, Tokyo, 176-187, 2012.
681. 芳原容英、山口弘輝、早川正士、地震に関連する ULF 帯磁場データの統計的解析、「地震予知研究の最前線」、早川正士編、日本専門図書出版(株)、306-321, 2012.
682. Singh, B., R. P. Singh, U. Singh, and M. Hayakawa, On the lithosphere-atmosphere coupling of seismo-electromagnetic signals and identification of their sources, in “The Frontier of Earthquake Prediction Studies”, Ed. by M. Hayakawa, Nihon-senmontosho-Shuppan, Tokyo, 532-554, 2012.
683. 安田好広、芳原容英、早川正士、VHF 帯電波を用いた地震予知の可能性、「地震予知研究の最前線」、早川正士編、日本専門図書出版(株)、574-590, 2012.
684. Sorokin, V. M., Yu. Ya. Ruzhin, A. K. Yaschenko, and M. Hayakawa, Seismo-related electric discharges in the lower atmosphere, in “The Frontier of Earthquake Prediction Studies”, Ed. by M. Hayakawa, Nihon-senmontosho-Shuppan, Tokyo, 592-611, 2012.
685. 早川正士、芳原容英、VLF/LF 送信局電波を用いた電離圏擾乱観測に基づく地震予知研究、「地震予知研究の最前線」、早川正士編、日本専門図書出版(株)、624-651, 2012.
686. Rozhnoi, A., M. Solovieva, and M. Hayakawa, Search for electromagnetic earthquake precursors by means of sounding of upper atmosphere-lower ionosphere boundary by VLF/LF signals, in “The Frontier of Earthquake Prediction Studies”, Ed. by M. Hayakawa, Nihon-senmontosho-Shuppan, Tokyo, 652-677, 2012.

687. Devi, M., A. K. Barbara, Ya. Yu. Ruzhin and M. Hayakawa, Over-the-horizon anomalous VHF propagation and earthquake precursors, *Survey Geophys.*, vol. 33, issue 5, 1081-1106, DOI 10.1007/ s10712-012-9185-z, 2012.
688. Hayakawa, M., Y. Hobara, Y. Yasuda, H. Yamaguchi, K. Ohta, J. Izutsu, and T. Nakamura, Possible precursor to the March 11, 2011, Japan earthquake: ionospheric perturbations as seen by subionospheric very low frequency/low frequency propagation, *Ann. Geophysics (Italy)*, vol. 55, no. 1, 95-99, doi: 10.4401/ag-5357, 2012.
689. Kopytenko, Yu. A., V. S. Ismaguilov, K. Hattori, and M. Hayakawa, Anomaly disturbances of the magnetic fields before the strong earthquake in Japan on March 11, 2011, *Ann. Geophysics (Italy)*, vol. 55, N. 1, 101-107, doi: 10.4401/ag-5260, 2012.
690. Ono, Y., Y. Ida, Y. Kasahara, Y. Hobara, M. Hayakawa, A. Rozhnoi, M. Solovieva, O. A. Molchanov, and K. Ohta, Ionospheric perturbations associated with two huge earthquakes in Japan, using principal component analysis for multiple subionospheric VLF/LF propagation paths, *Ann. Geophysics (Italy)*, vol. 55, N. 1, 139-148, doi: 10.4401/ag-5329, 2012.
691. Rozhnoi, A., M. Solovieva, P. F. Biagi, K. Schwingenschuh, and M. Hayakawa, Low frequency signal spectrum analysis for strong earthquakes, *Ann. Geophysics (Italy)*, vol. 55, no. 1, 181-186, doi: 10.4401/ag- 5076, 2012.
692. Rozhnoi, A., M. Solovieva, M. Parrot, M. Hayakawa, P. F. Biagi, and K. Schwingenschuh, Ionospheric turbulence from ground-based and satellite VLF/LF transmitter signal observations for the Simushir earthquake (November 15, 2006), *Ann. Geophysics (Italy)*, vol. 55, N. 1, 187-192, doi: 10.4401/ag- 5190, 2012.
693. Varlamov, A., N. Smirnova, M. Hayakawa, and K. Yumoto, Fractal characteristics of the ULF emissions along a meridian profile, based on the 210 MM stations data, *Acta Geophysica*, vol. 60, no. 3, pp. 928-941, doi:10.2478/s11600-012-0035-7, 2012.
694. Iudin, D. I., Ya. D. Sergeyev, and M. Hayakawa, Interpretation of percolation in terms of infinity computations, *Applied Mathematics and Computation*, Elsevier, vol. 218, no. 16, pp. 8099–8111, 2012.
695. Hayakawa, M., Short-term earthquake prediction with electromagnetic effects: Present situation, *New Concepts in Global Tectonics Newsletter*, No.63, 9-14, 2012.
696. Surkov V. V., and M. Hayakawa, Underlying mechanisms of transient luminous events: a review, *Ann. Geophysicae*, vol. 30, 1185–1212, 2012.
697. Nickolaenko A. P., I. G. Kudintseva, O. Pechony, M. Hayakawa, Y. Hobara, and Y. T. Tanaka, The effect of a gamma ray flare on Schumann resonances, *Ann. Geophysicae*, vol. 30, 1321–1329, 2012.
698. Hayakawa, M., Y. Kasahara, T. Endoh, Y. Hobara, and S. Asai, The observation of Doppler shifts of subionospheric LF signal in possible association with earthquakes, *J. Geophys. Res.*, vol. 117, A09304, doi:10.1029/2012JA017752, 2012.
699. Suzuki, T., M. Hayakawa, Y. Hobara, and K. Kusunoki, First detection of summer blue jets and starters over Northern Kanto area of Japan: Lightning activity, *J. Geophys. Res.*, vol. 117, A07307, doi:10.1029/2011JA017366, 2012.
700. Rozhnoi, A., S. Shalimov, M. Solovieva, B. Levin, M. Hayakawa, and S. Walker, Tsunami-induced phase and amplitude perturbations of subionospheric VLF signals, *J. Geophys. Res.*, vol. 117, A09313, doi:10.1029/2012JA017761, 2012.

701. Ida, Y., D. Yang, Q. Li, H. Sun, and M. Hayakawa, Fractal analysis of ULF electromagnetic emissions in possible association with earthquakes in China, *Nonlin. Processes Geophys.*, vol.19, 577–583, doi:10.5194/npg-19-577-2012, 2012.
702. Hayakawa, M., Y. Hobara, A. Rozhnoi, M. Solovieva, K. Ohta, J. Izutsu, T. Nakamura, Y. Yasuda, H. Yamaguchi, and Y. Kasahara, The ionospheric precursor to the 2011 March 11 earthquake as based on the Japan-Pacific subionospheric VLF/LF network observation, *Telecommunications and Radio Engineering*, vol.71, no.18, 1687-1706, 2012.
703. Schekotov A., E. Fedorov, Y. Hobara, and M. Hayakawa, ULF magnetic field depression as a possible precursor to the 2011/3.11 Japan earthquake, *Telecommunications and Radio Engineering*, vol.71, no.18, 1707-1718, 2012.
704. Hayakawa, M., A. Schekotov, O. Molchanov, and Y. Hobara, Estimation of the efficiency of combined characteristics of ULF-ELF fields as a precursor to earthquakes based on the observations in February-March 2007 in Moshiri, *J. Atmos. Electr.*, vol.32, No.1, 35-40, 2012.
705. Hayakawa, M., Y. Hobara, and T. Suzuki, Lightning effects in the mesosphere and ionosphere, in “Lightning Electromagnetics”, Ed. by V. Cooray, Chapter 16, *Inst. Engineering and Technology*, 611-646, 2012.
706. Hobara, Y., and M. Hayakawa, The effects of lightning on the ionosphere/magnetosphere, in “Lightning Electromagnetics”, Ed. by V. Cooray, Chapter 17, *Inst. Engineering and Technology*, 647-685, 2012.
707. Hayakawa, M., N. Yonaiguchi, Y. Ida, S. Masuda, and Y. Hobara, Fractal analysis of electromagnetic emissions in possible association with earthquakes, in “Classification and Application of Fractals” Ed. by W. L. Hagen, *Nova Sci. Pub.*, New York, Chapter 3, 83-101, 2012.
708. Hayakawa, M., Possible electromagnetic effects on abnormal animal behavior before an earthquake, *Animals*, Special Issue "Biological Anomalies Prior to Earthquakes", vol. 3, 19-32, doi:10.3390/ani3010019, 2013.
709. Hayakawa, M., A. Rozhnoi, M. Solovieva, Y. Hobara, K. Ohta, A. Schekotov, and E. Fedorov, The lower ionospheric perturbation as a precursor to the 11 March 2011 Japan earthquake, *Geomatics, Natural Hazards and Risk*, vol. 4, no. 3, 275-287, doi:org/10.1080/19475705.2012.751938, 2013.
710. Hayakawa, M., A. Schekotov, E. Fedorov, and Y. Hobara, On the ultra-low-frequency magnetic field depression for three huge oceanic earthquakes in Japan and in the Kurile islands, *Earth Science Research*, vol. 2, no. 1, 33-42, 2013.
711. Hobara, Y., R. Nakamura, M. Suzuki, M. Hayakawa, and M. Parrot, Ionospheric perturbations observed by the low altitude satellite DEMETER and possible relation with seismicity, *J. Atmos. Electr.*, vol.33, no.1, 21-29, 2013.
712. Schekotov, A., E. Fedorov, Y. Hobara, and M. Hayakawa, ULF magnetic field depression as a possible precursor to the 2011/3.11 Japan earthquake, *J. Atmos. Electr.*, vol.33, no.1, 41-51, 2013.
713. Nakamura, T., V. Korepanov, Y. Kasahara, Y. Hobara, and M. Hayakawa, An evidence on the lithosphere-ionosphere coupling in terms of atmospheric gravity waves on the basis of a combined analysis of surface pressure, ionospheric perturbations and ground-based ULF variations, *J. Atmos. Electr.*, vol.33, no.1, 53-68, 2013.

714. Endo, T., Y. Kasahara, Y. Hobara, T. Sue and M. Hayakawa, A note on the correlation of seismo-ionospheric perturbations with ground motions as deduced from F-net seismic observations, *J. Atmos. Electr.*, vol.33, no.1, 69-76, 2013.
715. Dudkin, F., V. Korepanov, M. Hayakawa, and A. De Santis, Possible model of electromagnetic signals before earthquakes, in "Thales", in honour of Prof. Emeritus M. E. Contadakis, Ziti Publishing, Thessaloniki, 159-170, 2013.
716. Hayakawa, M., Y. Hobara, A. Rozhnoi, M. Solovieva, K. Ohta, J. Izutsu, T. Nakamura, Y. Yasuda, H. Yamaguchi, and Y. Kasahara, The ionospheric precursor to the 2011 March 11 earthquake as based on the Japan-Pacific subionospheric VLF/LF network observation, in "Thales", in honour of Prof. Emeritus M. E. Contadakis, Ziti Publishing, Thessaloniki, 191-212, 2013.
717. Sorokin, V. and M. Hayakawa, Generation of seismic-related DC electric fields and lithosphere-atmosphere-ionosphere coupling, *Modern Appl. Sci.*, vol. 7, no. 6, 1-25, doi: 10.5539/mas.v7n6p1, 2013.
718. Hayakawa, M., A. Rozhnoi, and M. Solovieva, On the relative effect of magnitude and depth of earthquakes in the generation of seismo-ionospheric perturbations at middle latitudes as based on the analysis of subionospheric propagation data of JJY (40 kHz)-Kamchatka path, *Open J. Earthquake Res.*, vol. 2, no. 2, 27-31, doi:10.4236/ojer.2013.22003, 2013.
719. Hayakawa, M., Y. Hobara, A. Rozhnoi, M. Solovieva, K. Ohta, J. Izutsu, T. Nakamura, and Y. Kasahara, The ionospheric precursor to the 2011 March 11 earthquake based upon observations obtained from the Japan-Pacific subionospheric VLF/LF network, *Terr. Atmos. Ocean. Sci.*, vol. 24, no. 3, 393-408, doi: 10.3319/TAO.2012.12.14.01(AA), 2013.
720. Kumar, A., S. Kumar, M. Hayakawa, and F. Menk, Subionospheric VLF perturbations observed at low latitude associated with earthquake from Indonesia region, *J. Atmos. Solar-terr. Phys.*, vol. 102, 71-80, 2013.
721. Nickolaenko, A. P., and M. Hayakawa, Localized ionospheric disturbance over the earthquake epicentre and modifications of Schumann resonance electromagnetic fields, *Geomatics, Natural Hazards and Risk*, doi:10.1080/19475705.2013.809557, 2013.
722. Hayakawa, M., and A. V. Shvets, The integrated effect of an earthquake swarm in the generation of subionospheric VLF ionospheric perturbations, *Int'l J. New Concepts in Global Tectonics*, vol.1, no. 2, 96-101, 2013.
723. Smirnova, N. A., D. A. Kiyashchenko, V. N. Troyan, and M. Hayakawa, Multifractal approach to study the earthquake precursory signatures using the ground-based observations, *Review of Applied Physics*, vol. 2, Iss. 3, 58-67, 2013.
724. Schekotov, A.Yu., A. P. Nickolaenko, M. Hayakawa, Y. Hobara, G. Satori, J. Bor, and M. Neska, Worldwide detection of ELF transient associated with the gamma flare of December 27, 2004, *Telecommunications and Radio Engineering*, vol. 72, no. 18, 1695-1718, 2013.
725. Ohta, K., J. Izutsu, A. Schekotov, and M. Hayakawa, The ULF/ELF electromagnetic radiation before the 11 March 2011 Japanese earthquake, *Radio Sci.*, vol. 48, 589-596, doi:10.1002/rds.20064, 2013.
726. Hayakawa, M., and Y. Hobara, Seismo electromagnetic studies in Chofu, in "Earthquake Prediction Studies: Seismo Electromagnetics", Ed. by M. Hayakawa, TERRAPUB, Tokyo, 57-80, 2013.

727. Schekotov, A., E. Fedorov, O. A. Molchanov, and M. Hayakawa, Low frequency electromagnetic precursors as a prospect for earthquake prediction, in “Earthquake Prediction Studies: Seismo Electromagnetics”, Ed. by M. Hayakawa, TERRAPUB, Tokyo, 81-99, 2013.
728. Rozhnoi, A., M. Solovieva, and M. Hayakawa, VLF/LF signals method for searching of electromagnetic earthquake precursors, in “Earthquake Prediction Studies: Seismo Electromagnetics”, Ed. by M. Hayakawa, TERRAPUB, Tokyo, 31-48, 2013.
729. Hobara, Y., T. Inoue, M. Hayakawa, and K. Shiokawa, Deducing locations and charge moment changes of lightning discharges by ELF network observations in Japan, *IEEE Trans. Power and Energy*, vol. 133, no. 12, 994-1000, doi.org/10.1541/ieejpes.133.994, 2013.
730. Popova, I., A. Rozhnoi, M. Solovieva, B. Levin, M. Hayakawa, Y. Hobara, P. F. Biagi, and K. Schwingenschuh, Neural network approach to the prediction of seismic events based on low-frequency signal monitoring of the Kuril-Kamchatka and Japanese regions, *Ann. Geophysics (Italy)*, vol. 56, no. 3, R0328; doi:10.4401/ag-6224, 2013.
731. Rozhnoi, A., M. Hayakawa, M. Solovieva, Y. Hobara, and V. Fedun, Ionospheric effects of the Mt. Kirishima volcanic eruption as seen from subionospheric VLF observations, *J. Atmos. Solar-terr. Phys.*, vol. 107, 54-59, 2014.
732. Shvets, A. V., T. M. Serdiuk, Y. V. Gorishnyaya, Y. Hobara, and M. Hayakawa, Estimating the lower ionosphere height and lightning location using multimode “tweek” atmospherics, *J. Atmos. Solar-terr. Phys.*, vol. 108, 1-9, 2014.
733. Sorokin, V. M., A. K. Yaschenko, and M. Hayakawa, Scattering of VHF transmitter signals by seismic-related electric discharges in the troposphere, *J. Atmos. Solar-terr. Phys.*, vol. 109, 15-21, 2014.
734. Rozhnoi, A., M. Solovieva, M. Hayakawa, H. Yamaguchi, Y. Hobara, B. Levin and V. Fedun, Tsunami-driven ionospheric perturbations associated with the 2011 Tohoku earthquake as detected by subionospheric VLF signals, *Geomatics, Natural Hazards and Risk*, doi:10.1080/19475705.2014.888100, 2014.
735. Nickolaenko, A. P., and M. Hayakawa, Spectra and waveforms of ELF transients in the Earth-ionosphere cavity with small losses, *Radio Sci.*, vol. 49, no. 2, 118–130, doi:10.1002/2013RS005281, 2014.
736. Singh, B., R. Tyagi, Y. Hobara, and M. Hayakawa, X-rays and solar proton event induced changes in the first mode Schumann resonance frequency observed at a low latitude station Agra, India, *J. Atmos. Solar-terr. Phys.*, vol. 113, 1-9, 2014.
737. Hayakawa, M., and A. Schekotov, On the ionospheric perturbation for the 1995 Kobe earthquake: revisited, *Geomatics, Natural Hazards and Risk*, doi.org/10.1080/19475705.2014.895965, 2014.
738. Fedorov, E., A. Schekotov, Y. Hobara, R. Nakamura, N. Yagova, and M. Hayakawa, The origin of spectral resonance structures of the ionospheric Alfvén resonator. Single high-altitude reflection or resonant cavity excitation?, *J. Geophys. Res.*, vol. 119, no. 4, 3117-3129, doi:10.1002/2013JA019428, 2014.
739. Sorokin, V., and M. Hayakawa, Plasma and electromagnetic effects caused by the seismic-related disturbances of electric current in the global circuit, *Modern Appl. Sci.*, vol. 8, no. 4, 61-83, doi:10.5539/mas.v8n4p61, 2014.

740. Rozhnoi, A., S. Shalimov, M. Solovieva, B. Levin, G. Shevchenko, M. Hayakawa, Y. Hobara, S. N. Walker, and V. Fedun, Detection of tsunami-driven phase and amplitude perturbations of subionospheric VLF signals following the 2010 Chile earthquake, *J. Geophys. Res.*, vol. 119, no. 6, 5012–5019, doi:10.1002/2014JA019766, 2014.
741. Kamiyama, M., M. Sugito, M. Kuse, A. Schekotov, and M. Hayakawa, On the precursors to the 2011 Tohoku earthquake: crustal movements and electromagnetic signatures, *Geomatics, Natural Hazards and Risk*, doi:10.1080/19475705.2014.937773, 2014.
742. Nickolaenko, A. P., A. Yu. Schekotov, M. Hayakawa, Y. Hobara, G. S'atori, J. Bor, and M. Neska, Multi-point detection of the ELF transient caused by the gamma flare of December 27, 2004, *Radiophysics and Quantum Electronics*, vol. 57, no. 2, 125-140, 2014.
743. Silin, N. V., N. V. Korovkin, and M. Hayakawa, Electromagnetic radiation from power equipments as diagnostics of their technical evaluation, *J. Energy Power Sources*, vol. 1, no. 2, 89-100, 2014.
744. Rozhnoi, A., M. Solovieva, B. Levin, M. Hayakawa, and V. Fedun, Meteorological effects in the lower ionosphere as based on VLF/LF signal observations, *Natural Hazards Earth System Sci.*, vol. 14, 2671-2679, doi:10.5194/nhess-14-2671-2014, 2014.
745. Rozhnoi, A., M. Solovieva, V. Fedun, M. Hayakawa, K. Schwingenschuh, and B. Levin, Correlation of very low and low frequency signal variations at mid-latitudes with magnetic activity and outer-zone particles, *Ann. Geophys.*, vol. 32, 1455-1462, doi: 10.5194/angeo-32-1455-2014, 2014
746. Iudin, D. I., Ya. D. Sergeev, and M. Hayakawa, Infinity computations in cellular automaton forest-fire model, *Commun. Nonlinear Sci. Numer. Simulat.*, vol. 20, no. 3, 861-870, doi:10.1016/j.cnsns.2014.06.031, 2015.
747. Hayakawa, M., A. Schekotov, S. Potirakis, and K. Eftaxias, Criticality features in ULF magnetic fields prior to the 2011 Tohoku earthquake, *Proc. Jpn. Acad., Ser. B*, vol. 91, 25-30, doi: 10.2183/pjab.91.25, 2015.
748. Nickolaenko, A. P., A. V. Koloskov, M. Hayakawa, Yu. M. Yampolski, O. V. Budanov, and V. E. Korepanov, 11-year solar cycle in Schumann resonance data as observed in Antarctica, *Sun and Geosphere*, vol. 10, no.1, 39-49, 2015.
749. Tsunoda, F., T. Kawabe, Y. Kubota, M. Hayakawa, and D. R. Choi, Tendency of volcano-seismic activity developed in the central part of the Honshu Arc, Japan, *Int'l J. New Concepts in Global Tectonics*, vol. 3, no. 1, 34-42, 2015.