

References

- Aarons, J. (1997), Global positioning system phase fluctuations at auroral latitudes, *J. Geophys. Res.*, *102*, 17,219–17,231.
- Abdu, M. A., J. H. A. Sobral, E. R. de Paula, and I. S. Batista (1991), Magnetospheric disturbance effects on the Equatorial Ionization Anomaly (EIA): an overview, *J. Atmos. Terr. Phys. Atmos.*, *53*, 757–771.
- Abdu, M. A., I. S. Batista, and J. R. de Souza (1996), An overview of IRI-observational data comparison in American (Brazilian) sector low latitude ionosphere, *Adv. Space Res.*, *18*(6), 13 – 22.
- Abdu, M. A., I. S. Batista, A. J. Carrasco, and C. G. M. Brum (2005), South atlantic magnetic anomaly ionization: A review and a new focus on electrodynamic effects in the equatorial ionosphere, *J. Atmos. Sol. Terr. Phys.*, *67*, 1643–1657, doi:10.1016/j.jastp.2005.01.014.
- Ahn, B. H., R. Robinson, Y. Kamide, and S. I. Akasofu (1983), Electric conductivities, electric fields and auroral particle energy injection rate in the auroral ionosphere and their empirical relations to horizontal magnetic disturbance, *Planet Space Sci.*, *31*, 641.
- Ahn, B. H., A. Richmond, Y. Kamide, H. Kroehl, B. Emery, O. de la Beaujardiere, and S. I. Akasofu (1998), An ionospheric conductance model based on ground magnetic disturbance data, *J. Geophys. Res.*, *103*, 14,769.
- Akasofu, S.-I., and S. Chapman (1964), On the asymmetric development of magnetic storm fields in low and middle latitudes, *Planet Space Sci.*, *12*, 607–626.
- Ambili, K. M., R. K. Choudhary, and J.-P. S. Maurice (2014), Seasonal differences in the sunrise undulations at the dip equator at solar minimum at two distinct locations and their relation with postsunset electrodynamics, *J. Geophys. Res.*, *119*.
- Amm, O., et al. (2008), Towards understanding the electrodynamics of the 3-dimensional high-latitude ionosphere: present and future, *Ann. Geophys.*, *26*, 3913–3932.
- Anderson, D., A. Anghel, K. Yumoto, M. Ishitsuka, and E. Kudeki (2002), Estimating daytime vertical ExB drift velocities in the equatorial F-region using ground-based magnetometer observations, *Geophys. Res. Lett.*, *29*(12), 37–1, doi:10.1029/2001GL014562.
- Anderson, D. N. (1973a), A theoretical study of the ionospheric F region equatorial anomaly, II. results in the American and Asian sectors, *Planet. Space. Sci.*, *21*, 421–442.

- Anderson, D. N. (1973b), A theoretical study of the ionospheric F region equatorial anomaly, I Theory, *Planet. Space Sci.*, *21*, 409.
- Anderson, D. N., J. Buchau, and R. A. Heelis (1988), Origin of density enhancements in the winter polar cap ionosphere, *Radio Science*, *23*(4), 513–519, doi:10.1029/RS023i004p00513.
- Andrews, D. G., J. R. Holton, and L. C. B (1987), *Middle Atmosphere Dynamics*, 259-294 pp., Academic Press.
- Araki, T. (1977), Global structure of geomagnetic sudden commencements, *Planet. Space Sci.*, *25*, 373–384.
- Astafyeva, E., I. Zakharenkova, and M. Forster (2015), Ionospheric response to the 2015 St. Patrick's Day storm: A global multi-instrument overview, *J. Geophys. Res.*, *120*, doi:10.1002/2015JA021629.
- Aubry, M. P., C. T. Russel, and M. G. Kivelson (1970), Inward motion of the magnetopause before a substorm, *J. Geophys. Res.*, *75*, 7018–7031, doi:10.1029/JA075i034p07018.
- Balan, N., and G. J. Bailey (1995), Equatorial plasma fountain and its effects: Possibility of an additional layer, *Journal of Geophysical Research: Space Physics*, *100*(A11), 21,421–21,432, doi:10.1029/95JA01555.
- Balan, N., G. J. Bailey, and B. Jayachandran (1993), Ionospheric evidence for a nonlinear relationship between the solar E.U.V and 10.7 cm fluxes during an intense solar cycle, *Planetary and Space Sciences*, *41*, 141–145.
- Balan, N., G. J. Bailey, M. A. Abdu, K. I. Oyama, P. Richards, J. MacDougall, and I. Batista (1997a), Equatorial plasma fountain and its effects over three locations: Evidence for an additional layer, the F3 layer, *J. Geophys. Res.*, pp. 2047–2056.
- Balan, N., Y. Otsuka, and S. Fukao (1997b), New aspects in the annual variation of the ionosphere observed by the MU radar, *Geophys. Res. Lett.*, *24*, 2287–2290, doi:10.1029/97GL02184.
- Balan, N., Y. Otsuka, S. Fukao, M. A. Abdu, and G. J. Bailey (2000), Annual variations of the ionosphere: A review based on MU radar observations, *Adv. Space Res.*, *25*(1), 153 – 162.
- Balan, N., K. Shiokawa, Y. Otsuka, T. Kikuchi, D. V. Lekshmi, S. Kawamura, M. Yamamoto, and G. J. Bailey (2010), A physical mechanism of positive ionospheric storms at low and midlatitudes, *J. Geophys. Res.*, *115*, A02,304, doi:10.1029/2009JA014515.
- Balan, N., M. Yamamoto, J. Y. Liu, Y. Otsuka, H. Liu, and H. Luhr (2011), New aspects of thermospheric and ionospheric storms revealed by CHAMP, *J. Geophys. Res.*, *116*(A07305), doi:10.1029/2010JA0160399.
- Balan, N., J. Y. Liu, Y. Otsuka, S. T. Ram, and H. Luhr (2012), Ionospheric and thermospheric storms at equatorial latitudes observed by CHAMP, ROCSAT, and DMSP, *J. Geophys. Res.*, *117*(A01313), doi:10.1029/2011JA016903.
- Balan, N., Y. Otsuka, M. Nishioka, J. Y. Liu, and G. J. Bailey (2013), Physical mechanisms of the ionospheric storms at equatorial and higher latitudes during the recovery phase of geomagnetic storms, *Journal of Geophysical Research: Space Physics*, *118*(5), doi:10.1002/jgra.50275.

- Baron, M. J., C. J. Heinselman, and J. Petriceks (1983), Solar cycle and seasonal variations of the ionosphere observed with the Chatanika incoherent scatter radar, *Radio Sci.*, *18*(6), 895–900.
- Barry, R. G., and R. J. Chorley (1998), *Atmosphere, Weather, and Climate*, 7 ed., Routledge, London.
- Bartels, J., and H. F. Johnston (1940a), Geomagnetic tides in horizontal intensity at Huancayo, 1, *J. Geophys. Res.*, *45*, 269–308.
- Bartels, J., and H. F. Johnston (1940b), Geomagnetic tides in horizontal intensity at Huancayo, 2, *J. Geophys. Res.*, *45*, 485–592.
- Batista, I. S., J. R. de Souza, M. A. Abdu, and E. R. de Paula (1994), Total electron content at low latitudes and its comparison with the IRI90, *Advances in Space Research*, *14*(12), 87 – 90.
- Baumjohann, W. (1983), Ionospheric and field-aligned current systems in the auroral zone: A concise review, *Adv. Space Res.*, *2*, 55–62.
- Beaujardiere, O. D., D. Alcayde, J. Fontanari, and C. Leger (1991), Seasonal Dependence of High-Latitude Electric Fields, *J. Geophys. Res.*, *96*(A4), 5723–5735.
- Beaujardiere, O. D. A., et al. (1985), Universal time dependence of nighttime F region densities at high latitudes, *J. Geophys. Res.*, *90*, 4319–4332.
- Berkner, L. V., and H. W. Wells (1938), Non-seasonal change of F2-region ion-density, *Terrestrial Magnetism and Atmospheric Electricity*, *43*(1), 15–36, doi:10.1029/TE043i001p00015.
- Bhuyan, P. K., and R. R. Borah (2007), TEC derived from GPS network in India and comparison with the IRI, *Adv. Space Res.*, *39*, 830 – 840.
- Bilitza, D. (Ed.) (1990), *World Data Center A, Rockets and Satellites*, NSSDC - 90 - 22, Greenbelt, MD, USA,.
- Bilitza, D. (2001), International reference ionosphere 2000, *Radio Sci.*, *36*, 261–275.
- Bilitza, D. (2015), The International Reference Ionosphere - Status 2013, *Adv. Space Res.*, *55*, 1914–1927.
- Bilitza, D., and B. W. Reinisch (2008), International reference ionosphere 2007: improvements and new parameters, *Adv. Space. Res.*, *42*, 599–609.
- Blanc, M., and A. D. Richmond (1980), The ionospheric disturbance dynamo, *J. Geophys. Res.*, *85*, 16,925.
- Boström, R. (1964), A model of the auroral electrojets, *J. Geophys. Res.*, *69*, 4983–4999, doi:10.1029/JZ069i023p04983.
- Bramley, E. N., and M. Peart (1965a), Effect of ionization transport on the equatorial F region, *Nature*, *206*, 1245–1246.
- Brasseur, G. P., and S. Solomon (2005), *Aeronomy of the Middle atmosphere: Chemistry and Physics of the Stratosphere and mesosphere*, 1-637 pp., Springer.
- Brekke, A. (2013), *Physics of the Upper Polar Atmosphere*, 1-408 pp., Springer.
- Brekke, A., and C. Hall (1988), Auroral ionospheric quiet time summer conductances, *Ann. Geophysicae*, *6*, 361–376.

- Brinton, H. C., J. M. Grebowsky, and L. H. Brace (1978), The high-latitude winter F region at 300 km: thermal plasma observations from AE-C, *J. Geophys. Res.*, *83*(A10), 4767–4776.
- Brunner, F. K., H. Hartinger, and L. Troyer (1999), GPS Signal diffraction modeling: The stochastic SIGMA- Δ model, *J. Geod.*, *73*, 259–267.
- Buonsanto, M. J. (1995), A case study of the ionospheric storm dusk effect, *J. Geophys. Res.*, *100*(A12), 23,857–23,869.
- Buonsanto, M. J. (1999), Ionospheric storms-Review, *Space Sci. Rev.*, *88*, 563–601.
- Buonsanto, M. J., J. C. Foster, A. D. Galasso, D. P. Sipler, and J. M. Holt (1990), Neutral winds and thermosphere/ionosphere coupling and energetics during the geomagnetic disturbances of March 6-10, 1989, *J. Geophys. Res.*, *95*, 21,033–21,050.
- Burch, J. L. (1968), Low-energy electron fluxes at latitudes above the auroral zone, *J. Geophys. Res.*, *73*(11), 1243–1250.
- Burch, J. L., and R. A. Heelis (1980), IMF changes and polar cap electric fields and currents, *in: Dynamics of the Magnetosphere*, p. 47.
- Burke, W. J. (1984), High-latitude electrodynamic: Observations from S3-2, *Space Sci. Rev.*, *37*, 161.
- Burns, A. G., T. L. Killeen, W. Deng, G. R. Carignan, and R. G. Roble (1995), Geomagnetic storm effects in the low-to middle-latitude upper thermosphere, *J. Geophys. Res.*, *100*, 673–14, doi:10.1029/94JA03232.
- Cai, H. T., S. Y. Ma, Y. Fan, Y. C. Liu, and K. Schlegel (2007), Climatological features of electron density in the polar ionosphere from long-term observations of EICSAT/ESR radar, *Ann. Geophys.*, *25*, 2561–2569.
- Chakrabarty, D., R. Sekar, R. Narayanan, and C. V. Devasia (2005), Evidence for interplanetary electric field effect on the OI 630.0 nm airglow over low latitudes, *J. Geophys. Res.*, *110*(A11301), doi:10.1029/2005JA011221.
- Chapman, S. (1918), The diurnal changes of the Earth's magnetism, *The Observatory*, *41*, 52–60.
- Chapman, S. (1919), The solar and lunar variation of the Earth's magnetism, *Phil. Trans. R. Soc. Lond.*, (A218), 1–118.
- Chapman, S. (1931a), The absorption and dissociative or ionizing effect of monochromatic radiation in an atmosphere on a rotating earth, *Proc. Phys. Soc. (London)*, *43*, 26–45.
- Chapman, S. (1931b), The absorption and dissociative or ionizing effect of monochromatic radiation in an atmosphere on a rotating earth. II, *Proc. Phys. Soc. (London)*, *43*, 483–501.
- Chapman, S. (1948), The abnormal daily variation of horizontal force at Huancayo and in Uganda, *J. Geophys. Res.*, *53*, 247–250.
- Chapman, S. (1951), The equatorial electrojet as detected from the abnormal electric current distribution about Huancayo, Peru and elsewhere, *Arch. Meteorol. Geophys. Bioklimatal*, *4*, 368.
- Chapman, S. (1956), The electrical conductivity of the ionosphere: A review, *Il Nuovo Cimento (1955-1965)*, *4*, 1385–1412.

- Chapman, S., and J. Bartels (1940), *Geomagnetism Chapter IX*, vol. 1, Oxford, Clarendon.
- Chapman, S., and K. O. Rajarao (1965), The H and Z variation along and near equatorial electrojet in India, *J. Atmos. Terr. Phys.*, *27*, 559–581.
- Chaston, C. C., J. W. Bonnell, C. W. Carlson, J. P. McFadden, R. E. Ergun, and R. J. Strangeway (2003), Properties of small-scale Alfvén waves and accelerated electrons from FAST, *Journal of Geophysical Research: Space Physics*, *108*(A4), doi:10.1029/2002JA009420.
- Chen, F. (1987), *Plasma Physics and Nuclear Engineering*, Prentice Hall.
- Cherniak, I., I. Zakharenkova, and R. J. Redmon (2015), Dynamics of the high-latitude ionospheric irregularities during the 17 March 2015 St.Patrick’s Day storm: Ground-based GPS measurements, *Space Weather*, *13*, 585–597, doi:10.1002/2015SW001237.
- Choudhary, R. K., J. P. St.-Maurice, K. M. Ambili, and R. Sridharan (2012), Plausible evidence for the multifaceted role played by the neutral wind in the Equatorial Electrodynamic during magnetically disturbed times, *J. Geophys. Res.*, *117*, doi:10.1029/2011JA017177.
- Christensen, A. B. (2003), Initial observations with the Global Ultraviolet Imager (GUVI) in the NASA TIMED satellite mission, *J. Geophys. Res.*, *108*(A12), 1451, doi:10.1029/2003JA009918.
- Clausen, L. B. N., J. B. H. Baker, J. M. Ruohoniemi, S. E. Milan, J. C. Coxon, S. Wing, S. Ohtani, and B. J. Anderson (2013), Temporal and spatial dynamics of the regions 1 and 2 Birkeland currents during substorms, *J. Geophys. Res.*, *118*, 3007–3016.
- Connor, H. K., E. Zesta, D. M. Ober, and J. Raeder (2014), The relation between transpolar potential and reconnection rates during sudden enhancement of solar wind dynamic pressure: OpenGGCM-CTIM results, *Journal of Geophysical Research: Space Physics*, *119*(5), 3411–3429, doi:10.1002/2013JA019728, 2013JA019728.
- Coroniti, P. V., and C. F. Kennel (1972), Polarization of the Auroral Electrojet, *J. Geophys. Res.*, *77*, 2835–2850.
- Cowley, S. W. H. (2000), Magnetosphere-Ionosphere Interactions: A Tutorial Review, in *Magnetospheric currents in Geophys. Monograph series*, pp. 91–106.
- Cowley, S. W. H., and M. Lockwood (1992), Excitation and decay of solar wind-driven flows in the magnetosphere-ionosphere system, *Ann. Geophys.*, *10*, 103–115.
- Davies, K. (1989), Ionospheric Radio, *IEE Electromagnetic Wave Series 31*.
- Dessler, A. J., and E. N. Parker (1959), Hydromagnetic theory of magnetic storms, *J. Geophys. Res.*, *64*, 2239.
- Duncan, R. A. (1962), Universal-Time control of the Arctic and Antarctic F region, *J. Geophys. Res.*, *67*(5).
- Duncan, R. A. (1969), F-region seasonal and magnetic storm behaviour, *J. Atmos. Terr. Phys.*, *31*, 59–70.
- Dungey, J. W. (1961), Interplanetary Magnetic Field and the Auroral Zones, *Phys. Rev. Lett.*, *6*, 47 – 48, doi:10.1103/PhysRevLett.6.47.
- Eastman, T. E., E. W. H. Jr., S. J. Bame, and J. R. Asbridge (1976), The magnetospheric boundary layer: site of plasma, momentum and energy transfer from the magnetosheath into the magnetosphere, *Geophys. Res. Lett.*, *3*, 685–688.

- Ebihara, Y., and Y. Miyoshi (2010), Dynamic Inner Magnetosphere: A Tutorial and Recent Advances, in *Dynamic Magnetosphere*, vol. 3, edited by W. Liu and M. Fujimoto, pp. 145–188.
- Eccles, D. (1973), Enhancements of electron concentration in the F_2 layer at magnetic noon, *J. Atmos. Terr. Phys.*, *35*(12), 1309–1315.
- Egedal, J. (1947), The magnetic diurnal variation of the horizontal force near the magnetic equator, *J. Geophys. Res.*, *52*, 449.
- Egedal, J. (1948), Daily variation of the horizontal magnetic force at the magnetic equator, *Nature*, *161*, 443–444.
- El-Rabbany, A. (2002), *Introduction to GPS: The Global Positioning System*, Artech House mobile communications series, Artech House, Boston.
- Elphinstone, R. D., J. S. Murphree, and L. L. Cogger (1996), What is a global auroral substorm?, *Revs. Geophys.*, *34*, 169–232.
- Erickson, G. M., R. W. Spiro, and R. A. Wolf (1991), The Physics of the Harang Discontinuity, *J. Geophys. Res.*, *96*(A2), 1633–1645.
- Evans, J. V. (1970a), The June 1965 magnetic storm: Millstone Hill observations, *J. Atmos. Terr. Phys.*, *32*, 1629–1640.
- Evans, J. V., J. M. Holt, W. L. Oliver, and R. H. Wand (1980), Millstone Hill incoherent scatter observations of auroral convection over $60^\circ \leq \Lambda \leq 75^\circ$, 2, Initial results, *J. Geophys. Res.*, *41*, 85.
- Evans, J. V., J. M. Holt, W. L. Oliver, and R. H. Wand (1983), Millstone Hill incoherent scatter observations of auroral convection over $60^\circ \leq \Lambda \leq 75^\circ$, 3, Average patterns versus Kp, *J. Geophys. Res.*, *88*, 5505.
- Fairfield, D. H. (1971), Average and unusual locations of the earth's magnetopause and bowshock, *J. Geophys. Res.*, *76*, 6700.
- Fang, X., C. E. Randall, D. Lummerzheim, S. C. Solomon, M. J. Mills, D. R. Marsh, C. H. Jackman, W. Wang, and G. Lu (2008), Electron impact ionization: A new parameterization for 100eV to 1 MeV electrons, *J. Geophys. Res.*, *113*(A09311), doi:10.1029/2008JA013384.
- Farley, D. T., E. Bonelli, B. G. Fejer, and M. F. Larsen (1986), The pre-reversal enhancement of the zonal electric field in the equatorial ionosphere, *J. Geophys. Res.*, *91*, 13,723 – 13,728.
- Farmer, A. D., S. R. Crothers, and V. N. Davda (1990), The winter anomaly at Tromso, *J. Atmos. Terr. Phys.*, *52*(6-2), 561–568.
- Fedder, J. A., and J. G. Lyon (1987), The solar wind-magnetosphere-ionosphere current-voltage relationship, *Geophysical Research Letters*, *14*(8), 880–883, doi:10.1029/GL014i008p00880.
- Fejer, B. G. (1997), The electrodynamics of the low latitude ionosphere: Recent results and future challenges, *J. Atmos. Terr. Phys.*, *59*, 1465–1482.
- Fejer, B. G., and J. T. Emmert (2003), Low-latitude ionospheric disturbance electric field effects during the recovery phase of the 19-21 October 1998 magnetic storm, *J. Geophys. Res.*, *108*(A12), 1454, doi:10.1029/2003JA010190.

- Fejer, B. G., and L. Scherliess (1995), Time dependent response of equatorial ionospheric electric fields to magnetospheric disturbances, *Geophys. Res. Lett.*, *22*(7), 851 – 854, doi:10.1029/95GL00390.
- Fejer, B. G., C. A. Gonzalez, D. T. Farley, M. C. Kelley, and R. F. Woodman (1979), Equatorial electric fields during magnetically disturbed conditions 1. The effect of the interplanetary magnetic field, *J. Geophys. Res.*, *84*(13), 5797–5802.
- Fejer, B. G., J. R. Souza, A. S. Santos, and A. E. C. Pereira (2005), Climatology of F-region zonal plasma drifts over Jicamarca, *Journal of Geophysical Research*, *110*, A12,310, doi:10.1029/2005JA011324.
- Fejer, B. G., J. W. Jensen, and S. Y. Su (2008), Seasonal and longitudinal dependence of equatorial disturbance vertical plasma drifts, *Geophys. Res. Lett.*, *35*, L20,106, doi: 10.1029/2008GL035584.
- Feldstein, Y. I., and G. V. Starkov (1967), Dynamics of auroral belt and polar geomagnetic disturbances, *Planet Space Sci.*, *15*(2), 209–229.
- Field, P. R., H. Rishbeth, R. J. Moffett, T. J. Fuller-Rowell, and G. H. Millward (1992), Wave-mean flow interaction in the storm-time thermosphere: a two-dimensional model simulation, *Journal of the Atmospheric and Sciences*, *49*, 660–680.
- Field, P. R., H. Rishbeth, R. J. Moffett, T. J. Fuller-Rowell, and G. H. Millward (1998), Modelling composition changes in F-layer storms, *Journal of Atmospheric and Solar-Terrestrial Physics*, *60*, 523–543.
- Foster, J. C. (1983), An empirical electric field model derived from Chatanika radar data, *J. Geophys. Res.*, *88*, 981.
- Foster, J. C. (1993), Storm time plasma transport at middle and high latitudes, *J. Geophys. Res.*, *98*, 1675–1689.
- Foster, J. C. (2008), Ionospheric-Magnetospheric-Heliospheric Coupling: Storm-Time Thermal Plasma Redistribution, *Geophysical Monograph Series*, *181*, doi:10.1029/181GM12.
- Foster, J. C., and W. J. Burch (2002), SAPS: A New Categorization for Sub-auroral Electric Fields, *EOS*, *83*(36), 393–394.
- Foster, J. C., J. R. Doupnik, and G. S. Stiles (1981), Large-scale patterns of auroral ionospheric convection observed with Chatanika radar, *J. Geophys. Res.*, *86*, 11,357.
- Foster, J. C., A. J. Coster, P. J. Erickson, F. J. Rich, and B. R. Sandel (2004), Stormtime observations of the flux of plasmaspheric ions to the dayside cusp/magnetopause, *Geophys. Res. Lett.*, *31*(L08809), doi:10.1029/2004GL020082.
- Foster, J. C., et al. (2005), Multiradar observations of the polar tongue of ionization, *Journal of Geophysical Research: Space Physics*, *110*(A9), doi:10.1029/2004JA010928, a09S31.
- Foster, J. C., et al. (2013), Prompt energisation of relativistic and highly relativistic electrons during a substorm interval: Van Allen Probes Observations, *Geophys. Res. Lett.*, *41*, doi:10.1002/2013GL058438.
- Foster, J. C., A. J. Coster, P. J. Erickson, F. J. Rich, and B. R. Sandel (2014), Stormtime observations of the flux of plasmaspheric ions to the dayside cusp/magnetopause, *Geophys. Res. Lett.*, *31*(L08809), doi:10.1029/2004GL020082.

- Fuller-Rowell, T. J. (1998), The Thermospheric Spoon, *J. Geophys. Res.*, *103*, 3951–3956.
- Fuller-Rowell, T. J., and D. S. Evans (1987), Height-integrated Pedersen and Hall conductivity patterns inferred from the TIROS-NOAA satellite data, *Journal of Geophysical Research: Space Physics*, *92*(A7), 7606–7618, doi:10.1029/JA092iA07p07606.
- Fuller-Rowell, T. J., M. V. Codrescu, and R. J. Moffett (1994), Response of the thermosphere and ionosphere to geomagnetic storms, *J. Geophys. Res.*, *99*, 3893–3914.
- Fuller-Rowell, T. J., M. V. Codrescu, and S. Quegan (1996), On the seasonal response of thermosphere and ionosphere to geomagnetic storms, *J. Geophys. Res.*, *101*, 2343–2353.
- Fuller-Rowell, T. J., M. V. Codrescu, R. G. Roble, and A. D. Richmond (1997), How Does the Thermosphere and Ionosphere React to a Geomagnetic Storm?, p. 203, Magnetic Storms, Geophysical Monograph Series.
- Fuller-Rowell, T. J., G. H. Millward, A. D. Richmond, and M. V. Codrescu (2002), Storm-time changes in the upper atmosphere at low latitudes, *Journal of Atmospheric and Solar-Terrestrial Physics*, *64*, 1383 – 1391.
- Galand, M., T. Fuller-Rowell, and M. Codrescu (2001), Response of the upper atmosphere to auroral protons, *J. Geophys. Res.*, *106*, 127.
- Garner, T. W., R. A. Wolf, R. W. Spiro, W. J. Burke, B. G. Fejer, S. S. Sazykin, J. L. Roeder, and M. R. Hairston (2004), Magnetospheric electric fields and plasma sheet injection to low L-shells during the 4-5 June 1991 magnetic storm: Comparison between the Rice Convection Model and observations, *Journal of Geophysical Research: Space Physics*, *109*(A2), doi:10.1029/2003JA010208, a02214.
- Gonzales, C. A., M. C. Kelley, R. A. Behnke, J. F. Vickrey, R. F. Woodman, and J. Holt (1983), On the latitudinal variations of the ionospheric electric field during magnetospheric disturbances, *J. Geophys. Res.*, *88*, 9135–9144.
- Gonzalez, W. D., and B. T. Tsurutani (1987), Criteria of interplanetary parameters causing intense magnetic storms ($Dst < -100$ nT), *Planet. Space. Sci.*, *35*, 1101.
- Gonzalez, W. D., B. Tsurutani, A. Gonzalez, E. Smith, F. Tang, and S.-I. Akasofu (1989), Solar wind-magnetosphere coupling during intense magnetic storms (1978-1979), *J. Geophys. Res.*, *94*, 8835.
- Gonzalez, W. D., J. A. Joselyn, Y. Kamide, H. W. Kroehl, G. Rostoker, B. T. Tsurutani, and V. M. Vasyliunas (1994), What is a geomagnetic storm?, *J. Geophys. Res.*, *99*(A4), 5771–5792.
- Goody, R. M., and J. C. G. Walker (1972), *Atmospheres*, Prentice Hall.
- Greenwald, R. A., et al. (1995), Darn/Superdarn: A Global View of the Dynamics of High-Latitude Convection, *Space Science Reviews*, *71*, 761 – 796.
- Gussenhoven, M. S., D. A. Hardy, and R. L. Carovillano (1984), in *The Polar Cusp, Series C: Mathematical and Physical Sciences*, vol. 145, edited by J. A. Holtet and A. Egeland, pp. 85–97, D. Reidel Publishing Company.
- Hansen, A., J. Blanch, and T. Walter (2000), Ionospheric correction analysis for WAAS: quiet and stormy, *ION GPS*, pp. 634–642.
- Hanson, W. B., and R. J. Moffett (1966), Ionisation transport effects in the equatorial F region, *J. Geophys. Res.*, *71*, 5559.

- Harang, L. (1946), The mean field of disturbance of polar geomagnetic, *Terr. Magn. Atmos. Electr.*, *51*(3), 353–380, doi:10.1029/TE051i003p00353.
- Hardy, D. A., M. S. Gussenhoven, R. Raistrick, and W. J. McNeil (1987), Statistical and functional representations of the pattern of auroral energy flux, number flux, and conductivity, *Journal of Geophysical Research: Space Physics*, *92*(A11), 12,275–12,294, doi:10.1029/JA092iA11p12275.
- Harel, M., R. A. Wolf, R. W. Spiro, P. H. Reiff, C. K. Chen, W. J. Burke, F. J. Rich, and M. Smiddy (1981), Quantitative simulation of a magnetospheric substorm 2. Comparison with observations, *J. Geophys. Res.*, *86*, 2242.
- Hargreaves, J. K. (1992), *The Solar-Terrestrial Environment*, Cambridge University Press, Cambridge, U.K.
- Heelis, R. A., J. K. Lowell, and R. W. Spiro (1982), A model of the high-latitude ionospheric convection pattern, *J. Geophys. Res.*, *87*, 6339.
- Heikkila, W. J., and J. D. Winningham (1971), Penetration of magnetosheath plasma at low altitudes through the dayside magnetospheric cusps, *J. Geophys. Res.*, *76*(4), 883–897.
- Happner, J. P. (1972), Electric fields in the magnetosphere, in *Critical Problems of Magnetospheric Physics*, edited by E. R. Dyer, p. 107, IUCSTP Secretariat, National Academy of Sciences, Washington D. C.
- Happner, J. P. (1973), High-latitude electric fields and the modulations related to interplanetary magnetic field parameters, *Radio Sci.*, *8*, 933–948.
- Happner, J. P., and N. C. Maynard (1987a), Empirical High-latitude Electric Field Models, *J. Geophys. Res.*, *92*(A5), 4467–4489.
- Happner, J. P., and N. C. Maynard (1987b), Empirical high-latitude electric field models, *J. Geophys. Res.*, *92*, 4467 – 4489.
- Holzer, R. E., and J. A. Slavin (1978), Magnetic flux transfer associated with expansions and contractions of the dayside magnetosphere, *J. Geophys. Res.*, *83*, 3831.
- Horvath, I., and B. C. Lovell (2014), Perturbation electric fields and disturbance currents investigated during the 25 September 1998 great storm, *J. Geophys. Res.*, *119*, doi:10.1002/2014JA020480.
- Huang, C. M. (2013), Disturbance dynamo electric fields in response to geomagnetic storms at different universal times, *J. Geophys. Res.*, *118*, 496–501, doi:10.1029/2012JA018118.
- Huang, C. S., J. C. Foster, L. P. Goncharenko, G. J. Sofko, J. E. Borovsky, and F. J. Rich (2003), Midlatitude ionospheric disturbances during magnetic storms and substorms, *J. Geophys. Res.*, *108*(A6), 1244.
- Huang, C.-S., J. C. Foster, and M. C. Kelley (2005), Long-duration penetration of the interplanetary electric field to the low-latitude ionosphere during the main phase of magnetic storms, *Journal of Geophysical Research (Space Physics)*, *110*(A9), 11,309, doi:10.1029/2005JA011202.
- Huang, X., and B. W. Reinisch (1996), Vertical electron density profiles from the Digisonde network, *Adv. Space. Res.*, *18*, 6121–6129.

- Huang, Y. N., and K. Cheng (1996), Solar cycle variations of the equatorial ionospheric anomaly in total electron content in the Asian region, *J. Geophys. Res.*, *101*, 24,513–24,520.
- Iijima, T., and T. A. Potemra (1976), The amplitude distribution of field-aligned currents at northern high latitudes observed by Triad, *J. Geophys. Res.*, *81*, 2165.
- Iijima, T., and T. A. Potemra (1978), Large-scale characteristics of field-aligned currents associated with substorms, *J. Geophys. Res.*, *83*, 599.
- Immel, T. J., G. Crowley, J. D. Craven, and R. G. Roble (2001), Dayside enhancements of thermospheric O/N_2 following magnetic storm onset, *J. Geophys. Res.*, *106*(A8), 488, doi:10.1029/2000JA000096.
- Iyemori, T., and D. R. K. Rao (2008), Decay of the Dst field of geomagnetic disturbance after substorm onset and its implication to storm-substorm relation, *Ann. Geophys.*, *14*, 608–618.
- Jordanova, V. K., Y. S. Miyoshi, S. Zaharia, M. F. Thomsen, G. D. Reeves, D. S. Evans, C. G. Mouikis, and J. F. Fennell (2006), Kinetic simulations of ring current evolution during the Geospace Environment Modeling challenge events, *Journal of Geophysical Research: Space Physics*, *111*(A11), doi:10.1029/2006JA011644, a11S10.
- Jordanova, V. K., S. Zaharia, and D. T. Welling (2010), Comparative study of ring current development using empirical, dipolar, and self-consistent magnetic field simulations, *Journal of Geophysical Research: Space Physics*, *115*(A12), doi:10.1029/2010JA015671, a00J11.
- Jordanova, V. K., D. T. Welling, S. G. Zaharia, L. Chen, and R. M. Thorne (2012), Modeling ring current ion and electron dynamics and plasma instabilities during a high-speed stream driven storm, *Journal of Geophysical Research: Space Physics*, *117*(A9), doi:10.1029/2011JA017433, a00L08.
- Joshi, L. M., S. Sripathi, and R. Singh (2016), Simulation of low-latitude ionospheric response to 2015 St.Patrick's Day super geomagnetic storm using ionosonde-derived PRE vertical drifts over Indian region, *J. Geophys. Res.*, *121*, doi:10.1002/2015JA021512.
- Kakad, B., D. Tiwari, and T. K. Pant (2011), Study of disturbance dynamo effects at nighttime equatorial Fregion in Indian longitude, *J. Geophys. Res.*, *116*, A12,318, doi:10.1029/2011JA016626.
- Kaplan, E. D., and C. J. Hegarty (2006), *Understanding GPS Principles and applications, II*, Artech House, Boston.
- Kavita, S., R. S. Dabas, and S. Ravindran (2012), Study of total electron content variations over equatorial and low latitude ionosphere during extreme solar minimum, *Astrophys. Space Sci.*, *341*, 277 – 286.
- Kelley, M. C. (1989), *The earth's ionosphere. Plasma physics and electrodynamics, International Geophysics series*, vol. 43, Academic Press INC.
- Kelley, M. C., B. G. Fejer, and C. A. Gonzales (1979), An explanation for anomalous equatorial ionospheric electric fields associated with a northward turning of the interplanetary magnetic field, *Geophys. Res. Lett.*, *6*, 301.
- Kenpankho, P., K. Watthanasangmechai, P. Supnithi, T. Tsugawa, and T. Maruyama (2011), Comparison of GPS TEC measurements with IRI TEC prediction at the

- equatorial latitude station, Chumphon, Thailand, *Earth, Planets and Space*, 63(4), doi:10.5047/eps.2011.01.010.
- Kikuchi, T. (1986), Evidence of transmission of polar electric fields to the low latitude at times of geomagnetic sudden commencements, *J. Geophys. Res.*, 91, 31013105, doi:10.1029/JA091iA03p03101.
- Kikuchi, T., and T. Araki (1979), Horizontal transmission of the polar electric field to the equator, *J. Atmos. Sol. Terr. Phys.*, 41, 927 – 936.
- Kikuchi, T., and K. Hashimoto (2016), Transmission of the electric fields to the low latitude ionosphere in the magnetosphere-ionosphere current circuit, *Geoscience Letters*, 3(1), 4.
- Kikuchi, T., T. Araki, H. Maeda, and K. Maekawa (1978), Transmission of polar electric fields to the Equator, *Nature*, 273, 650–651, doi:10.1038/273650a0.
- Kikuchi, T., H. Luhr, T. Kitamura, O. Saka, and O. Schlegel (1996), Direct penetration of the polar electric field to the equator during a DP2 event as detected by the auroral and equatorial magnetometer chains and the EISCAT radar, *J. Geophys. Res.*, 101, 17,161.
- Kikuchi, T., H. Luhr, K. Schlegel, H. Tachihara, M. Shinohara, and T. I. Kitamura (2000b), Penetration of auroral electric fields to the equator during a substorm, *J. Geophys. Res.*, 105, 23,251.
- Kikuchi, T., K. Hashimoto, T. Kitamura, H. Tachihara, and B. Fejer (2003), Equatorial counter electrojets during substorms, *J. Geophys. Res.*, 108(A11), 1406, doi:10.1029/2003JA009915.
- Kikuchi, T., K. H. Hashimoto, and K. Nazoki (2008), Penetration of magnetospheric electric fields to the equator during a geomagnetic storm, *J. Geophys. Res.*, 113(A06214), doi:10.1002/2007JA012628.
- King, J. W., H. Kohl, and R. Pratt (1967), The effect of atmospheric winds on the height of the F2-layer peak at middle and high latitudes, *J. Atmos. Terr. Phys.*, 29, 1529–1539.
- Kivelson, M. G., and C. T. Russell (1995), *Introduction to Space Physics*, 1-568 pp., Cambridge University Press.
- Klobuchar, J. A. (1996), Ionospheric effects on GPS, *Global Positioning System: Theory and applications*, 1, 485–515.
- Knetch, R. W. (1959), Observations of the ionosphere over the south geographic pole, *J. Geophys. Res.*, 64, 1243–1250.
- Knudsen, W. C. (1974), Magnetospheric convection and the high-latitude F_2 ionosphere, *J. Geophys. Res.*, 79, 1046–1055.
- Koskinen, H. E. J., and T. I. Pulkkinen (1995), Midnight velocity shear zone and the concept of Harang discontinuity, *Journal of Geophysical Research: Space Physics*, 100(A6), 9539–9547, doi:10.1029/95JA00228.
- Lal, C. (1992), Global F2 Layer Ionization and Geomagnetic Activity, *J. Geophys. Res.*, 97, 12,153–12,159.
- Lal, C. (1998), Solar wind and equinoctial maxima in geophysical phenomena, *J. Atmos. Terr. Phys.*, 60, 1017–1024.

- Le, G., C. T. Russell, and K. Takahashi (2004), Morphology of the ring current derived from magnetic field observations, *Annales Geophysicae*, *22*(4), 1267–1295.
- Le, G., et al. (2016), Magnetopause erosion during the 17 March 2015 magnetic storm: Combined field-aligned currents, auroral oval, and magnetopause observations, *Geophys. Res. Lett.*, *43*, 2396–2404, doi:10.1002/2016GL068257.
- Lei, J., Q. Zhu, W. Wang, A. G. Burns, B. Zhao, X. Luan, J. Zhong, and X. Dou (2015), Response of the topside and bottomside ionosphere at low and middle latitudes to the October 2003 superstorms, *J. Geophys. Res.*, *120*, doi:10.1002/2015JA021310.
- Leick, A. (1995), *GPS Satellite Surveying*, 2 ed., Wiley, New York.
- Li, X., D. N. Baker, M. Temerin, G. D. Reeves, and R. Belian (1998), Simulation of dispersionless injections and drift echoes of energetic electrons associated with substorms, *Geophysical Research Letters*, *25*(20), 3763–3766, doi:10.1029/1998GL900001.
- Lin, C. H., J. Y. Liu, T. W. Fang, P. Y. Chang, H. F. Tsai, C. H. Chen, and C. C. Hsiao (2007), Motions of the equatorial ionization anomaly crests imaged by FORMOSAT-3/COSMIC, *Geophys. Res. Lett.*, *34*(1), L19,101, doi:10.1029/2007GL030741.
- Liu, H., C. Stolle, M. Forster, and S. Watanabe (2007), Solar activity dependence of the electron density in the equatorial anomaly regions observed by CHAMP, *J. Geophys. Res.*, *112*, A11,311.
- Liu, L., w. Wan, B. Ning, and M. L. Zhang (2009a), Climatology of the mean total electron content derived from GPS global ionospheric maps, *J. Geophys. Res.*, *114*(A06308), doi:10.1029/2009JA014244.
- Liu, W., and M. Fujimoto (Eds.) (2011), IAGA Special Sopron Book Series 3, Springer Netherlands.
- Liu, W. L., et al. (2009b), Observation and modeling of the injection observed by THEMIS and LANL satellites during the 23 March 2007 substorm event, *Journal of Geophysical Research: Space Physics*, *114*(A1), doi:10.1029/2008JA013498, a00C18.
- Lockwood, M., and S. W. H. Cowley (1992), Ionospheric convection and the substorm cycle, in *Proceedings of the International Conference on Substorms (ICS-1)*, pp. 99–109, Kiruna, Sweden.
- Lopez-Puertas, M., M. A. Lopez-Valverde, and F. W. Taylor (1992), Vibrational temperature and radiative cooling of the CO₂ 15 mm bands in the middle atmosphere, *Quart. J. Roy. Meteor. Soc.*, *118*, 499–532.
- Lotko, W. (2007), The magnetosphere-ionosphere system from the perspective of plasma circulation: A tutorial, *Journal of Atmospheric Solar-Terrestrial Physics*, *69*, 191–211.
- Lotko, W., R. H. Smith, B. Zhang, J. E. Ouellette, O. J. Brambles, and J. G. Lyon (2014), Ionospheric control of magnetotail reconnection, *Science*, *345*(6193), 184–187, doi:10.1126/science.1252907.
- Lu, G., L. P. Goncharenko, A. D. Richmond, R. G. Roble, and N. Aponte (2008), A dayside ionospheric positive storm phase driven by neutral winds, *J. Geophys. Res.*, *113*(A08304), doi:10.1029/2007JA012895.
- Lühr, H., and C. Xiong (2010), IRI-2007 model overestimates electron density during

- the 23/24 solar minimum, *Geophysical Research Letters*, *37*(23), doi:10.1029/2010GL045430, 123101.
- Lyons, L. R. (1992), Formation of auroral arcs via magnetosphere-ionosphere coupling, *Rev. of Geophys.*, *30*, 93–112.
- Ma, S. Y., H. T. Cai, H. X. Liu, K. Schlegel, and G. Lu (2002), Positive storm effects in the dayside polar ionospheric F-region observed by EISCAT and ESR during the magnetic storm of 15 May 1997, *Ann. Geophys.*, *20*, 1377–1384.
- Maltseva, O. A., N. S. Mozhaeva, and T. V. Nikitenko (2013), Comparison of model and experimental ionospheric parameters at high latitudes, *Adv. Space Res.*, *51*(4), 599–609.
- Mannucci, A. J., B. T. Tsurutani, B. A. Iijima, A. Komjathy, A. Saito, W. D. Gonzalez, F. L. Guarneri, J. U. Kozyra, and R. Skoug (2005), Dayside global ionospheric response to the major interplanetary event of October 29-30, 2003 "Halloween storms", *Geophys. Res. Lett.*, *32*, 12, doi:10.1029/2004GL021467.
- Marghitu, O., T. Karlsson, B. Klecker, G. Haerendel, and J. McFadden (2009), Auroral arc and oval electrodynamic in the Harang region, *J. Geophys. Res.*, *114*(A03214), doi:10.1029/2008JA013630.
- Martyn, D. F. (1947), Atmospheric Tides in the Ionosphere. 1. Solar Tides in F2 region, *Proc. R. Soc. London*, *A189*, 241.
- Maruyama, N., A. D. Richmond, T. J. Fuller-Rowell, M. V. Codrescu, S. Sazykin, F. R. Toffoletto, R. W. Spiro, and G. H. Millward (2005), Interaction between direct penetration and disturbance dynamo electric fields in the storm-time equatorial ionosphere, *Geophys. Res. Lett.*, *32*, L17105, doi:10.1029/2005GL023763.
- Maruyama, T., G. Ma, and M. Nakamura (2004), Signature of TEC storm on 6 November 2001 derived from dense GPS receiver network and ionosonde chain over Japan, *J. Geophys. Res.*, *109*(A10302), doi:10.1029/2004JA010451.
- Matsushita, S. (1967), Solar quiet and lunar daily variation field, in *Physics of Geomagnetic Phenomena*, edited by S. Matsushita and W. H. Campbell, chap. 3, pp. 302–424, Academic Press, New York.
- Maynard, N. C. (1974), Electric field measurements across the Harang discontinuity, *J. Geophys. Res.*, *79*, 4620.
- Maynard, N. C., W. J. Burke, D. R. Weimer, F. S. Mozer, J. D. Scudder, C. T. Russell, W. K. Peterson, and R. P. Lepping (1998), Polar observations of convection with northward interplanetary magnetic field at dayside high latitudes, *J. Geophys. Res.*, *103*, 29 – 46, doi:10.1029/97JA02295.
- McNamara, L. F. (1984), Prediction of total electron content using the International Reference Ionosphere, *Adv. Space Res.*, *4*(1), 25 – 50.
- McNamara, L. F. (1985), The use of total electron content measurements to validate empirical models of the ionosphere, *Advances in Space Research*, *5*(7), 81 – 90.
- Mendillo, M. (2006), Storms in the ionosphere: Patterns and processes for Total Electron Content, *Rev. Geophys.*, *44*(RG4001).
- Mendillo, M., and J. A. Klobuchar (1975), Investigations of the ionospheric F region using multistation total electron content observations, *J. Geophys. Res.*, *80*, 643–650.

- Mendillo, M., C. Huang, X. Pi, and H. Rishbeth (2005), The global ionospheric asymmetry in total electron content, *J. Atmos. Terr. Phys.*, *67*(15), 1377–1387.
- Meng, C. I. (1970), Variation of the magnetopause position with substorm activity, *J. Geophys. Res.*, *75*, 3252.
- Meng, C. I. (1980), *Polar cap variations and the interplanetary magnetic field*, p. 23, D. Reidel, Hingham, Mass.
- Merkin, V. G., A. S. Sharma, K. Papadopoulos, G. Milikh, J. Lyon, and C. Goodrich (2005), Global MHD simulations of the strongly driven magnetosphere: Modeling of the transpolar potential saturation, *Journal of Geophysical Research: Space Physics*, *110*(A9), doi:10.1029/2004JA010993.
- Merkine, V. G., K. Papadopoulos, G. Milikh, A. S. Sharma, X. Shao, J. Lyon, and C. Goodrich (2003), Effects of the solar wind electric field and ionospheric conductance on the cross polar cap potential: Results of global MHD modeling, *Geophysical Research Letters*, *30*(23), doi:10.1029/2003GL017903.
- Milan, S. E., et al. (2017), Overview of Solar Wind–Magnetosphere–Ionosphere–Atmosphere Coupling and the Generation of Magnetospheric Currents, *Space Science Reviews*, *206*(1), 547–573.
- Millward, G. H., S. Quegan, R. J. Moffett, T. J. Fuller-Rowell, and D. Rees (1993), A modelling study of the coupled ionospheric and thermospheric response to an enhanced high-latitude electric field event, *Planet. Space Sci.*, *41*, 45–56.
- Millward, G. H., R. J. Moffett, S. Quegan, and T. J. Fuller-Rowell (1996), Ionospheric F2 layer seasonal and semiannual variations, *J. Geophys. Res.*, *101*, 5149–5156.
- Misra, P., and P. Enge (2001), *Global Positioning System Signals, Measurements and Performance*, Lincoln, Massachusetts.
- Mitchell, C. N., L. Alfonsi, G. DeFranceschi, M. Lester, V. Romano, and A. W. Wernik (2005), GPS TEC scintillation measurements from the polar ionosphere during the October 2003 storm, *J. Geophys. Res.*, *32*(L12S03), doi:10.1029/2004GL021644.
- Moen, J., and A. Brekke (1993), The solar flux influence on quiet time conductances in the auroral ionosphere, *Geophys. Res. Lett.*, *3*, A02, doi:10.1051/swsc/2013025.
- Moen, J., X. C. Qiu, H. C. Carlson, R. Fujii, and I. W. McCrea (2008), On the diurnal variability in F_2 -region plasma density above the EISCAT Svalbard radar, *Ann. Geophys.*, *26*, 2427–2433.
- Moen, J., K. Oksavik, L. Alfonsi, Y. Daabakk, V. Romano, and L. Spogli (2013), Space weather challenges of the polar cap ionosphere, *J. Space Weather Space Clim.*, *3*, A02, doi:10.1051/swsc/2013025.
- Moffett, R. J., R. A. Heelis, R. Sellek, and G. J. Bailey (1992), The temporal evolution of the ionospheric signatures of subauroral ion drifts, *Planet. Space Sci.*, *40*, 663–670.
- Nagata, T., and S. Kokubun (1962), An additional geomagnetic daily variation field (S_q^p field) in the polar region on a geomagnetically quiet day, *Rep. Ionosph. Space Res. Japan*, *16*, 256–274.
- Nava, B., J. Rodriguez-Zuluaga, K. Alazo-Cuartas, A. Kashcheyev, Y. Migoya-Orue, S. M. Radicella, C. Amory-Mazaudier, and R. Fleury (2016), Middle- and low-latitude

- ionospheric response to 2015 St. Patrick's day geomagnetic storm, *J. Geophys. Res.*, *121*, doi:10.1002/2015JA022299.
- Newell, P. T., and C.-I. Meng (1992), Mapping the dayside ionosphere to the magnetosphere according to particle precipitation characteristics, *Geophys. Res. Lett.*, *19*(6), 602–612.
- Newell, P. T., K. Liou, and G. R. Wilson (2009), Polar cap particle precipitation and aurora: Review and commentary, *J. Atmos. Terr. Phys.*, *71*, 199–215.
- Newell, P. T., T. Sotirelis, and S. Wing (2010), Seasonal variations in diffuse, monoenergetic, and broadband aurora, *Journal of Geophysical Research: Space Physics*, *115*(A3), doi:10.1029/2009JA014805, a03216.
- Nishida, A., T. Iwasaki, and T. Nagata (1966), The origin of fluctuations in the equatorial electrojet: A new type of geomagnetic variation, *Ann. Geophys.*, *22*, 478.
- Olwendo, O. J., P. Baki, P. Cilliers, C. Mito, and P. Doherty (2013), Comparison of GPS TEC variations with IRI-2007 TEC prediction at equatorial latitudes during a low solar activity (20092011) phase over the Kenyan region, *Adv. Space Res.*, *52*(10), 1770 – 1779.
- Onwumechili, C. A. (1997), Spatial and temporal distributions of ionospheric currents in subsolar elevations, *J. Atmos. Terr. Phys.*, *59*, 1891–1899.
- Onwumechili, C. A. (1998), *The Equatorial Electrojet*, 627 pp., Gordon & Breach Science Publishers, Amsterdam, The Netherlands, ISBN:9056990691.
- Pavlov, A. V., N. M. Pavlova, and S. F. Makarenko (2010), A statistical study of the mid-latitude NmF2 winter anomaly, *Adv. Space Res.*, *45*, 374–385.
- Paxton, L. J. (1999), Global Ultraviolet Imager (GUVI): Measuring composition and energy inputs for the NASA Thermosphere-Ionosphere-Mesosphere Energetics and Dynamics (TIMED) mission, *Proc. SPIE Int. Soc. Opt. Eng.*, *3756*, 265–276.
- Paxton, L. J., C. I. Meng, G. H. Fountain, B. S. Ogorzalek, E. H. Darlington, J. Goldstein, and K. Peacock (1992a), SSUSI:Horizon-to-horizon and limb viewing spectrographic imager for remote sensing of environmental parameters, *Proc. SPIE*, *1764*, 161, doi: 10.1117/12.140846.
- Paxton, L. J., et al. (1992b), Special Sensor UV Spectrographic Imager (SSUSI): An Instrument description, *Instrum. Planet. Terr. Atmos. Remote Sens.*, *1745*, 2.
- Petrie, E. J., M. Hernández-Pajares, P. Spalla, P. Moore, and M. A. King (2011), A Review of Higher Order Ionospheric Refraction Effects on Dual Frequency GPS, *Surv. Geophys.*, *32*, 10.1007/s10,712–010–9105–z.
- Potemra, T. A. (1979), Current systems in the Earth's magnetosphere: A Review of U.S. Progress for the 19751978 IUGG Quadrennial Report, *Reviews of Geophysics*, *17*(4), 640–656, doi:10.1029/RG017i004p00640.
- Potemra, T. A. (1984), Magnetospheric Currents, *Washington DC American Geophysical Union Geophysical Monograph Series*, *28*.
- Potemra, T. A., T. Iijima, and N. A. Sافlekos (1980), *Large-Scale Characteristics of Birkeland Currents*, pp. 165–199, Springer Netherlands, Dordrecht.

- Powell, K. G., P. L. Roe, T. J. Linde, T.-I. Gombosi, and D.-L. D. Zeeuw (1999), A Solution-Adaptive Upwind Scheme for Ideal Magnetohydrodynamics, *Journal of Computational Physics*, 154, 284–309.
- Prölss, G. W. (1976), On explaining the negative phase of ionospheric storms, *Planet. Space Sci.*, 24, 607–609.
- Prölss, G. W. (1978), Travelling atmospheric disturbances as a possible explanation for daytime positive storm effects of moderate duration at middle latitudes, *J. Atmos. Terr. Phys.*, 40, 1351–1354.
- Prölss, G. W. (1980), Magnetic storm associated perturbations of the upper atmosphere: Recent results obtained by satellite-borne gas analyzers, *Rev. Geophys.*, 18(1), 183 – 202, doi:10.1029/RG018i001p00183.
- Prölss, G. W. (1991), Thermosphere-ionosphere coupling during disturbed conditions, *J. Geomagn. Geoelectr.*, 43, 537 – 549.
- Prölss, G. W. (1993a), On explaining the local time variation of ionospheric storm effects, *Annales de Geophysicae*, 11, 1 – 9.
- Prölss, G. W. (1993b), Common origin of positive ionospheric storms at middle latitudes and the geomagnetic activity effect at low latitudes, *J. Geophys. Res.*, 98, 5981–5991.
- Prölss, G. W. (1995), Ionospheric F-region storms, In :H., Volland (Ed.), *Handbook of Atmospheric Electrodynamics*, 2, 195–248.
- Prölss, G. W. (2004), *Physics of the Earth's Space Environment An Introduction*, 1-519 pp., Springer.
- Prölss, G. W., M. Roemer, and J. W. Slowey (1988), Dissipation of solar wind energy in the earth's upper atmosphere: The geomagnetic activity effect CIRA 1986, *Adv. Space Res.*, 8(5), 215–261.
- Pryse, S. E., R. W. Sims, J. Moen, L. Kersley, D. Lorentzen, and W. F. Denig (2004), Evidence for solar-production as a source of polar-cap plasma, *Annales Geophysicae*, 22(4), 1093–1102.
- Raghavarao, R., P. Sharma, and M. R. Sivaraman (1978), Correlation of ionisation anomaly with the intensity of electrojet, *Space Res.*, 18, 277–280.
- Rajesh, P. K., J. Y. Liu, N. Balan, C. H. Lin, Y. Y. Sun, and S. A. Pulnits (2016), Morphology of midlatitude electron density enhancement using total electron content measurements, *J. Geophys. Res. Space Physics*, 121, 1503 – 1517, doi: 10.1002/2015JA022251.
- Ramarao, P. V. S., K. Niranjana, B. V. R. Rao, B. V. P. S. Rao, and D. S. V. V. D. Prasad (1985), URSI/IPS Conference on the Ionosphere and Radiowave Propagation.
- Ramarao, P. V. S., S. G. Krishna, K. Niranjana, and D. S. V. V. D. Prasad (2006), Temporal and spatial variations in TEC using simultaneous measurements from Indian GPS network of receivers during the low solar activity period of 2005-2006, *Annals of Geophysics*, 24, 3279 – 3292.
- Ramjee, P., and M. Ruggieri (2005), *Applied satellite navigation using GPS, GALILEO and augmentation systems*, Artech mobile communication series, Artech House, Boston.

- Ramsingh, S. Sripathi, S. Sreekumar, S. Banola, K. Emperumal, P. Tiwari, and B. S. Kumar (2015), Low-latitude ionospheric response to super geomagnetic storm of 17/18 March 2015: Results from a chain of ground-based observations over Indian sector, *J. Geophys. Res.*, *120*, doi:10.1002/2015JA021509.
- Rastogi, R. G. (1959), The Diurnal Development of the Anomalous Equatorial Belt in the F2 Region of the Ionosphere, *J. Geophys. Res.*, *64*, 727–732.
- Rastogi, R. G., and J. A. Klobuchar (1990), Ionospheric electron content within the equatorial F2 layer anomaly belt, *J. Geophys. Res.*, *95*, 19,045.
- Rastogi, R. G., and V. L. Patel (1976), *Proc. Indian Acad. Sci.*, *A82*, 121–141.
- Ratcliffe, J. A. (1962), *The magneto-ionic theory and its applications to the ionosphere: A Monograph*, Cambridge Press.
- Ratcliffe, J. A. (1972), *An introduction in the Ionosphere and the Magnetosphere*, Cambridge University Press, Cambridge, U.K.
- Ratovsky, K. G., A. V. Oinats, and A. V. Medvedev (2013), Regular features of the polar ionosphere characteristics from digisonde measurements over Norilsk, *Adv. Space. Res.*, *51*(4), 545–553.
- Rees, M. H. (1989), *Physics and Chemistry of the Upper Atmosphere*, Cambridge University Press, Cambridge, U.K.
- Rees, M. H., B. A. Emery, R. G. Roble, and K. Stamnes (1983), Neutral and ion gas heating by auroral electron precipitation, *J. Geophys. Res.*, *88*, 6289–6300.
- Richmond, A. D., and Y. Kamide (1988), Mapping electrodynamic features of the high-latitude ionosphere from localized observations: Technique, *Journal of Geophysical Research: Space Physics*, *93*(A6), 5741–5759, doi:10.1029/JA093iA06p05741.
- Richmond, A. D., and G. Lu (2000), Upper-atmospheric effects of magnetic storms: a brief tutorial, *J. Atmos. Solar-Terr. Phys.*, *62*, 1115 – 1127.
- Richmond, A. D., and S. Matsushita (1975), Thermospheric response to a magnetic substorm, *J. Geophys. Res.*, *80*, 2839–2850.
- Richmond, A. D., and R. G. Roble (1997), Electrodynamic coupling effects in the thermosphere-ionosphere system, *Adv. Space Res.*, *20*, 1115 – 1124.
- Richmond, A. D., and J. P. Thayer (2000), Ionospheric Electrodynamics: A Tutorial, pp. 131–146, Magnetospheric current systems, Geophysical Monograph Series, Vol. 118.
- Ridley, A. J., T. I. Gombosi, and D. L. DeZeeuw (2004), Ionospheric control of the magnetosphere: conductance, *Ann. Geophys.*, *22*, 567–584.
- Ridley, A. J., Y. Deng, and G. Toth (2006), The global ionosphere-thermosphere model, *Journal of Atmospheric Solar-Terrestrial Physics*, *68*, 839–864.
- Rishbeth, H. (1972), Thermospheric winds and the F-region: A review, *J. Atmos. Terr. Phys.*, *34*, 1–47.
- Rishbeth, H. (1998), How the thermospheric circulation affects the ionospheric F2-layer, *J. Atmos. Terr. Phys.*, *60*, 1385–1402.
- Rishbeth, H. (2000), The equatorial F-layer: Progress and puzzles, *Ann. Geophys.*, *18*, 730–739.

- Rishbeth, H., and O. K. Garriott (1969), *Introduction to Ionospheric Physics*, Academic Press, New York.
- Rishbeth, H., and M. Mendillo (2001), Patterns of F2-layer variability, *J. Atmos. Terr. Phys.*, *63*, 1661–1680.
- Rishbeth, H., and I. C. F. Müller-Wodarg (2006), Why is there more ionosphere in January than in July? The annual asymmetry in the F2-layer, *Annales Geophysicae*, *24*(12), 3293–3311.
- Rishbeth, H., and C. S. G. K. Setty (1961), The F-layer at sunrise, *J. Atmos. Terr. Phys.*, *20*, 263.
- Rishbeth, H., T. J. Fuller-Rowell, and D. Rees (1987), Difusive equilibrium and vertical motion in the thermosphere during a severe magnetic storm: A computational study, *Planet Space Sci.*, *35*, 1157–1165.
- Robinson, R., R. Vondrak, K. Miller, T. Dabbs, and D. Hardy (1987), On calculating ionospheric conductances from the flux and energy of precipitating electrons, *J. Geophys. Res.*, *92*, 2565.
- Robinson, R. M., R. T. Tsunoda, J. F. Vickrey, and L. Guerin (1985), Sources of F region ionization enhancements in the nighttime auroral zone, *Journal of Geophysical Research: Space Physics*, *90*(A8), 7533–7546.
- Roble, R. G., R. E. Dickinson, and E. C. Ridley (1977), Seasonal and solar cycle variations of the zonal mean circulation in the thermosphere, *J. Geophys. Res.*, *82*(35), 5493–5504, doi:10.1029/JA082i035p05493.
- Roble, R. G., A. D. Richmond, W. L. Oliver, and R. M. Harper (1978), Ionospheric effects of the gravity wave launched by the September 18, 1974, sudden commencement, *J. Geophys. Res.*, *83*, 999–1009.
- Roble, R. G., R. E. Dickinson, and E. C. Ridley (1982), Global Circulation and Temperature Structure of Thermosphere With High-Latitude Plasma Convection, *J. Geophys. Res.*, *87*(A3), 1599–1614.
- Rodger, A., L. Brace, W. Hoegy, and J. Winningham (1986), The poleward edge of the mid-latitude trough—its formation, orientation and dynamics, *Journal of Atmospheric and Terrestrial Physics*, *48*(8), 715–728.
- Rodger, C. D., F. W. Taylor, A. H. Muggeridge, M. Lopez-Puertas, and M. A. Lopez-Valverde (1992), Local thermodynamic equilibrium of carbon dioxide in the upper atmosphere, *Geophys. Res. Lett.*, *19*, 589–592.
- Roelof, E. C., and D. G. Sibeck (1993), Magnetopause shape as a bivariate function of interplanetary magnetic field b_z and solar wind dynamic pressure, *J. Geophys. Res.*, *98*, 421–450.
- Rostoker, G., and C.-G. Falthammar (1967), Relationship between changes in the interplanetary magnetic field and variations in the magnetic field at the Earth's surface, *J. Geophys. Res.*, *72*, 5853.
- Rush, C. M., and A. D. Richmond (1973), The relationship between the structure of the equatorial anomaly and the strength of the equatorial electrojet, *J. Atmos. Terr. Phys.*, *35*, 1171.

- Russell, C. T. (1980), The control of the magnetopause by the interplanetary magnetic field, *Dynamics of the Magnetosphere*, edited by S.I. Akasofu, p. 3.
- Russell, C. T., and R. L. McPherron (1973), Semiannual variation of geomagnetic activity, *J. Geophys. Res.*, *78*, 92 – 108.
- Saha, K. (2008), Propagation of microwaves in the troposphere with potential application to GPS based navigation and meteorology with emphasis on Indian region, Ph.D. thesis, Faculty of Sciences, CUSAT.
- Sarris, T. E., X. Li, N. Tsaggas, and N. Paschalidis (2002), Modeling energetic particle injections in dynamic pulse fields with varying propagation speeds, *Journal of Geophysical Research: Space Physics*, *107*(A3), SMP 1–1–SMP 1–10.
- Sastri, J. H. (1988), Equatorial electric fields of ionospheric disturbance dynamo origin, *Ann. Geophys.*, *6*, 635 – 642.
- Sastri, J. H. (1990), Equatorial anomaly in F region: A review, *Indian J. Radio Space Phys.*, *19*, 225–240.
- Sastri, J. H., Y. N. Huang, T. Shibata, and T. Okuzawa (1995), Response of equatorial-low latitude ionosphere to sudden expansion of magnetosphere, *Geophys. Res. Lett.*, *22*, 2649.
- Sastri, J. H., N. Jyoti, V. Somayajulu, H. Chandra, and C. Devasia (2000), Ionospheric storm of early November 1993 in the Indian equatorial region, *J. Geophys. Res.*, *105*(A8), 18,443 – 18,455.
- Sastri, J. H., R. Sridharan, and T. K. Pant (2003), Equatorial Ionosphere-Thermosphere System During Geomagnetic Storms, in *Disturbances in Geospace: The Storm-Substorm Relationship Geophys. Monograph series*, vol. 142, pp. 185–203, doi:10.1029/142GM16.
- Sato, T., and T. Iijima (1979), Primary sources of large-scale Birkeland current, *Space Sci. Rev.*, *24*, 347–366.
- Scherliess, L., and B. G. Fejer (1999), Radar and satellite global equatorial F region vertical drift model, *J. Geophys. Res.*, *104*(A4), 6829 – 6842, doi:10.1029/1999JA900025.
- Schild, M. A., J. W. Freeman, and A. J. Dessler (1969), A source for field-aligned currents at auroral latitudes, *Journal of Geophysical Research*, *74*(1), 247–256, doi:10.1029/JA074i001p00247.
- Schodel, J. P. (1974), A global description of the F-region during the ionospheric storm of 17 December 1971, *J. Atmos. Solar-Terrest. Phys.*, *36*, 1121 – 1134.
- Schunk, R. W., and A. F. Nagy (2000), *Cambridge Atmospheric and Space Science Series.*, vol. 59, Cambridge University Press, Cambridge.
- Sckopke, N. (1966), A general relation between the energy of trapped particles and the disturbance field near the Earth, *J. Geophys. Res.*, *71*, 3125.
- Senior, C., and M. Blanc (1984), On the control of magnetospheric convection by the spatial distribution of ionospheric conductivities, *Journal of Geophysical Research: Space Physics*, *89*(A1), 261–284.
- Senior, C., and M. Blanc (1987), Convection in the inner magnetosphere - Model predictions and data, *Annales Geophysicae*, *5*, 405–420.

- Shreedevi, P. R., S. V. Thampi, D. Chakrabarty, R. K. Choudhary, T. K. Pant, A. Bhardwaj, and S. Mukherjee (2016), On the latitudinal changes in ionospheric electrodynamics and composition based on observations over the 76-77°E meridian from both hemispheres during a geomagnetic storm, *J. Geophys. Res. Space Physics*, *121*, doi:10.1002/2015JA021841.
- Shue, J. H., et al. (1998), Magnetopause location under extreme solar wind conditions, *J. Geophys. Res.*, *103*(A8), 17,691–17,700.
- Sibeck, D. G., R. E. Lopez, and E. C. Roelof (1991), Solar wind control of the magnetopause shape, location, and motion, *Journal of Geophysical Research: Space Physics*, *96*(A4), 5489–5495, doi:10.1029/90JA02464.
- Simi, K. G., S. V. Thampi, D. Chakrabarty, D. M. Pathan, S. R. P. Nayar, and T. K. Pant (2012), Extreme changes in the equatorial electrojet under the influence of interplanetary electric field and the associated modification in the low-latitude F region plasma distribution, *J. Geophys. Res.*, *117*(A03331), doi:10.1029/2011JA01732.
- Siscoe, G. L. (1982), Energy coupling between Region 1 and 2 Birkeland current systems, *J. Geophys. Res.*, *87*, 5124–5130.
- Siscoe, G. L., N. U. Crooker, and K. D. Siebert (2002), Transpolar potential saturation: Roles of region 1 current system and solar wind ram pressure, *Journal of Geophysical Research: Space Physics*, *107*(A10), doi:10.1029/2001JA009176.
- Smith, D. A., E. A. Araujo-Pradere, C. Minter, and T. Fuller-Rowell (2008), A comprehensive evaluation of the errors inherent in the use of a two-dimensional shell for modeling the ionosphere, *Radio Sci.*, *43*, RS6008.
- Smith, R. (1998a), Vertical winds: A tutorial, *Journal of Atmospheric Solar-Terrestrial Physics*, *60*, 1425–1434.
- Smith, R. (1998b), Ionosphere-thermosphere space weather issues, *Journal of Atmospheric Solar-Terrestrial Physics*, *58*, 1527–1574.
- Smitha, V. T., M. S. Bagiya, D. Chakrabarty, Y. B. Acharya, and M. Yamamoto (2014), An ensemble average method to estimate absolute TEC using radio beacon-based differential phase measurements: Applicability to regions of large latitudinal gradients in plasma density, *Radio Science*, *49*(12), doi:10.1002/2014RS005372, 2014RS005372.
- Smitha, V. T., P. R. Shreedevi, R. K. Choudhary, T. K. Pant, D. Chakrabarty, S. Sunda, S. Mukherjee, and A. Bhardwaj (2016), Direct observational evidence for disturbance dynamo on the daytime low-latitude ionosphere: A case study based on the 28 June 2013 space weather event, *Journal of Geophysical Research (Space Physics)*, *121*, 10,064–10,074, doi:doi:10.1002/2016JA023037.
- Sojka, J. J., M. D. Bowline, R. W. Schunk, D. T. Decker, C. E. Valladares, R. Sheehan, D. A. Anderson, and R. A. Heelis (1993), Modeling polar cap F-region patches using time varying convection, *Geophys. Res. Lett.*, *20*, 1783.
- Sojka, J. J., R. W. Schunk, M. D. Bowline, J. Chen, S. Slinker, J. Fedder, and P. J. Sulthan (1998), Ionospheric storm simulations driven by magnetospheric MHD and by empirical models with data comparisons, *J. Geophys. Res.*, *103*, 20,669–20,684.
- Southwood, D. J. (1977), The role of hot plasma in magnetospheric convection, *J. Geophys. Res.*, *82*, 5512–5520.

- Spiro, R. W., R. A. Wolf, and B. G. Fejer (1988), Penetrating of high-latitude-electric-field effects to low latitudes during SUNDIAL 1984, *Annales Geophysicae*, *6*, 39 – 49.
- Spogli, L., L. Alfonsi, G. D. Franceschi, V. Romano, M. H. O. Aquino, and A. Dodson (2009), Climatological of GPS scintillations over high and mid-latitude European regions, *Ann. Geophys.*, *27*, 3429–3437.
- St-Maurice, J. P., and D. G. Torr (1978), Nonthermal rate coefficients in the ionosphere : The reactions of O^+ with N_2 , O_2 , and NO , *J. Geophys. Res.*, *83*, 969 – 977.
- Stolle, C., C. Manoj, H. Luhr, S. Maus, and P. Alken (2008), Estimating the daytime equatorial ionization anomaly strength from electric field proxies, *J. Geophys. Res.*, *113*(A09310), doi:10.1029/2007JA012781.
- Tang, R. G., J., and B. Reinish (1988), *Progress on ARTIST Improvements, Interim Technical Report, North West Research Associates, Inc., Bellevue.*
- Tariku, Y. A. (2015), Patterns of GPS-TEC variation over low-latitude regions (African sector) during the deep solar minimum (2008 to 2009) and solar maximum (2012 to 2013) phases, *Earth, Planets and Space*, *67*, 10.1186/s40,623–015–0206–2.
- Themens, D. R., P. T. Jayachandran, M. J. Nicolls, and J. W. MacDougall (2014), A top to bottom evaluation of IRI 2007 within the polar cap, *J. Geophys. Res. Space Physics*, *119*, 6689–6703, doi:10.1002/2014JA020052.
- Thomas, E. G., J. B. H. Baker, J. M. Ruohoniemi, L. B. N. Clausen, A. J. Coster, J. C. Foster, and P. J. Erickson (2013), Direct observations of the role of convection electric field in the formation of a polar tongue of ionization from storm enhanced density, *J. Geophys. Res.*, *118*, 1180–1189.
- Titheridge, J. (1985), Ionogram analysis with the generalized program POLAN, *Tech. rep.*, WDC-A-STP, Boulder, CO.
- Titheridge, J. E. (1976), Ionospheric heating beneath the magnetospheric cleft, *J. Geophys. Res.*, *81*(19), 3221–3225.
- Titheridge, J. E. (1995), Computer-controlled operation of the IPS-42 ionosonde, *Tech. Rep. UAG-104*, World Data Center A for Solar-Terrestrial Physics, NOAA, E/GC2, Boulder, CO 80303, USA.
- Torr, D. M., and H. Brinton (1979), An experimental and theoretical study of the mean diurnal variation of O^+ , NO^+ ions in the midlatitude F_1 layer of the ionosphere, *J. Geophys. Res.*, *84*, 3360.
- Torr, M. R., and D. Torr (1973), The seasonal behavior of the F2-layer of the ionosphere, *J. Atmos. Terr. Phys.*, *35*(12), 2237–2251.
- Toth, G., et al. (2005), Space Weather Modeling Framework: A new tool for the space science community, *Journal of Geophysical Research: Space Physics*, *110*(A12), doi: 10.1029/2005JA011126, a12226.
- Troshichev, O. A., R. Y. Lukianova, V. O. Papitashvili, F. J. Rich, and O. Rasmussen (2000), Polar cap index (PC) as a proxy for ionospheric electric field in the near-pole region, *Geophys. Res. Lett.*, *27*, 3809.
- Tsurutani, B., et al. (2004), Global dayside ionospheric uplift and enhancement associated with interplanetary electric fields, *J. Geophys. Res.*, *109*, A8302, doi: 10.1029/2003JA010342.

- Tsurutani, B. T., et al. (2008), Prompt penetration electric fields (PPEFs) and their ionospheric effects during the great magnetic storm of 30-31 October 2003, *J. Geophys. Res. Space Physics*, *113*, A5311, doi:10.1029/2007JA012879.
- Tsyganenko, N. A. (1989), A magnetospheric magnetic field model with a warped tail current sheet, *Planet Space Sci.*, *37*, 5–20.
- TulasiRam, S., S.-Y. Su, and C. H. Liu (2009), FORMOSAT-3/COSMIC observations of seasonal and longitudinal variations of equatorial ionization anomaly and its interhemispheric asymmetry during the solar minimum period, *J. Geophys. Res.*, *114*, A06,311, doi:10.1029/2008JA013880.
- Tulasiram, S., et al. (2015), Duskside enhancement of equatorial zonal electric field response to convection electric fields during the St. Patrick's Day storm on 17 March 2015, *J. Geophys. Res.*, *120*, doi:10.1002/2015JA021932.
- Valladares, C. E., H. C. J. Carlson, and K. Fukui (1994), Interplanetary magnetic field dependency of stable Sun-aligned polar cap arcs, *J. Geophys. Res.*, *99*(A4), 6247–6272.
- Vasyliunas, V. M. (1970), Mathematical models of magnetospheric convection and its coupling to the ionosphere, in *Particules and Fields in the Magnetosphere*, edited by B. M. M. Cormac, pp. 60–71, Springer Netherlands.
- Vasyliunas, V. M. (1972), The inter-relationship of magnetospheric processes, in *Earths Magnetosphere Processes*, edited by M. M. Cormac and D. Reidel, pp. 29–38, Norwell Mass.
- Vasyliunas, V. M. (1984), Fundamentals of current description, in *Magnetospheric currents Geophys. Monograph series*, edited by T. Potemra, pp. 63–66, Washington D. C.
- Venkatesh, K., P. R. Fagundes, G. K. Seemala, R. de Jesus, A. J. de Abreu, and V. G. Pillat (2014), On the performance of the IRI-2012 and NeQuick2 models during the increasing phase of the unusual 24th solar cycle in the Brazilian equatorial and low-latitude sectors, *Journal of Geophysical Research: Space Physics*, *119*(6), 5087–5105, doi:10.1002/2014JA019960, 2014JA019960.
- Vichare, G., A. Ridley, and E. Yiğit (2012), Quiet-time low latitude ionospheric electrodynamic in the non-hydrostatic Global Ionosphere-Thermosphere Model, *Journal of Atmospheric Solar-Terrestrial Physics*, *80*, 161–172.
- Walker, G. O. (1981), Longitudinal structure of the equatorial ionization anomaly—a review, *J. Atmos. Terr. Phys.*, *43*, 763.
- Walker, I. K., J. Moen, L. Kersley, and D. A. Lorentzen (1999), On the possible role of cusp/cleft precipitation in the formation of polar-cap patches, *Annales Geophysicae*, *17*(10), 1298–1305.
- Walterscheid, R. L. (1982), The semiannual oscillation in the thermosphere as a conduction mode, *Ann. Geophys.*, *87*, 10,527–10,535.
- Warren, D. L. M., and J. F. Raquet (2002), Broadcast vs. Precise GPS Ephemerides: A Historical Perspective, Proc. ION National Technical Meeting, San Diego, CA.
- Weber, E., J. Buchau, J. Moore, J. R. Sharber, and R. C. Livingston (1984), F-layer ionization patches in the polar-cap, *J. Geophys. Res.*, *89*, 1683–1694.

- Wolf, R. A. (1970), Effects of ionospheric conductivity on convective flow of plasma in the magnetosphere, *Journal of Geophysical Research*, *75*(25), 4677–4698, doi:10.1029/JA075i025p04677.
- Wolf, R. A. (1983), *The quasi-static (slow flow) region of the magnetosphere*, 303–368 pp.
- Xu, S., B. C. Zhang, R. Y. Liu, L. X. Guo, and Y. W. Wu (2014), Comparative studies of ionospheric climatological features of MnF₂ among the Arctic and Antarctic stations, *J. Atmos. Terr. Phys.*, *119*, 63–70.
- Yasuhara, F., R. Greenwald, and S.-I. Akasofu (1983), On the rotation of the polar cap potential pattern and associated polar phenomena, *Journal of Geophysical Research: Space Physics*, *88*(A7), 5773–5777, doi:10.1029/JA088iA07p05773.
- Yeh, H. C., and J. C. Foster (1990), Storm time heavy ion outflow at mid-latitudes, *J. Geophys. Res.*, *95*, 7881–7891.
- Yeh, H. C., J. C. Foster, F. J. Rich, and W. Swider (1991), Storm-time electric field penetration observed at mid-latitude, *J. Geophys. Res.*, *96*, 5707.
- Yin, P., et al. (2009), Imaging of the Antarctic ionosphere: Experimental results, *J. Atmos. Terr. Phys.*, *71*, 1757–1765.
- Yu, Y., V. Jordanova, D. Welling, B. Larsen, S. G. Claudepierre, and C. Kletzing (2014), The role of ring current particle injections: Global simulations and Van Allen Probes observations during 17 March 2013 storm, *Geophysical Research Letters*, *41*(4), 1126–1132, doi:10.1002/2014GL059322.
- Yu, Y., V. Jordanova, S. Zou, R. Heelis, M. Ruohoniemi, and J. Wygant (2015), Modeling subauroral polarization streams during the 17 March 2013 storm, *J. Geophys. Res.*, *120*, 1738–1750, doi:10.1002/2014JA020371.
- Zaharia, S., C. Z. Cheng, and K. Maezawa (2004), 3-d force-balanced magnetospheric configurations, *Ann. Geophys.*, *22*, 251–265.
- Zaharia, S., V. K. Jordanova, M. F. Thomsen, and G. D. Reeves (2006), Self-consistent modeling of magnetic fields and plasmas in the inner magnetosphere: Application to a geomagnetic storm, *Journal of Geophysical Research: Space Physics*, *111*(A11), doi:10.1029/2006JA011619, a11S14.
- Zeng, Z., A. Burns, W. Wang, J. Lei, S. Solomon, S. Syndergaard, L. Qian, and Y. Kuo (2008), Ionospheric annual asymmetry observed by the COSMIC radio occultation measurements and simulated by the TIEGCM, *J. Geophys. Res.*, *113*(A07305), doi:10.1029/2007JA012897.
- Zhang, B., W. Lotko, O. Brambles, S. Xi, M. Wiltberger, and J. Lyon (2014), Solar wind control of auroral Alfvénic power generated in the magnetotail, *Journal of Geophysical Research: Space Physics*, *119*(3), 1734–1748, doi:10.1002/2013JA019178.
- Zhang, B.-C., Y. Kamide, R.-Y. Liu, H. Shinagawa, and K. Iwamasa (2004), A modeling study of ionospheric conductivities in the high latitude electrojet region, *J. Geophys. Res.*, *109*, A04,310.
- Zhao, B., W. Wan, L. Liu, T. Mao, Z. Ren, M. Wang, and A. B. Christensen (2007), Features of annual and semiannual variations derived from the global ionospheric maps of the total electron content, *Ann. Geophys.*, *25*, 2513–2527.