

References

- Adrian, M. L., D. L. Gallagher, and L. A. Avakov (2004), IMAGE EUV observation of radially bifurcated plasmaspheric features: First observations of a possible standing ULF waveform in the inner magnetosphere, *J. Geophys. Res.*, 109, A01203, doi:10.1029/2004JA009974.
- Baker, D. N., S. G. Kanekal, X. Li, S. P. Monk, J. Goldstein, and J. L. Burch (2004), An extreme distortion of the Van Allen belt arising from the 'Halloween' solar storm in 2003, *Nature*, 432, 878, doi:10.1038/nature03116.
- Banks, P. M., A. F. Nagy, and W. I. Axford (1971), Dynamical behavior of thermal protons in the mid-latitude ionosphere and magnetosphere, *Planet. Space Sci.*, 19, 1053, doi:10.1016/0032-0633(71)90104-8.
- Brice, N. M. (1967), Bulk motion of the magnetosphere, *J. Geophys. Res.*, 72, 5193.
- Burch, J. L., J. Goldstein, T. W. Hill, D. T. Young, F. J. Crary, A. J. Coates, N. Andre, W. S. Kurth, and E. C. Sittler Jr. (2005), Properties of local plasma injections in Saturn's magnetosphere, *Geophys. Res. Lett.*, 32, L14S02, doi:10.1029/2003GL019164.
- Carpenter, D., and J. Lemaire (2004), The Plasmasphere Boundary Layer, *Ann. Geophys.*, 22, 4291, doi:10.5194/angeo-22-4291-2004.
- Carpenter, D. L. (1963), Whistler Evidence of a 'Knee' in the Magnetospheric Ionization Density Profile, *J. Geophys. Res.*, 68, 1675, doi:10.1029/JZ068i006p01675.
- Carpenter, D. L. (1970), Whistler evidence of the dynamic behavior of the duskside bulge in the plasmasphere, *J. Geophys. Res.*, 75, 3837.
- Carpenter, D. L. (1995), Earth's plasmasphere awaits rediscovery, *EOS Trans. AGU*, 76, 89, doi:10.1029/95EO00041.
- Carpenter, D. L., and R. R. Anderson (1992), An ISEE/Whistler model of equatorial electron density in the magnetosphere, *J. Geophys. Res.*, 97, 1097, doi:10.1029/91JA01548.
- Carpenter, D. L., and J. Lemaire (1997), Erosion and recovery of the plasmasphere in the plasmopause region, *Space Sci. Rev.*, 80, 153.
- Carpenter, D. L., B. L. Giles, C. R. Chappell, P. M. E. Decreau, R. R. Anderson, A. M. Persoon, A. J. Smith, Y. Corcuff, and P. Canu (1993), Plasmasphere dynamics in the duskside bulge region: A new look at old topic, *J. Geophys. Res.*, 98, 19243, doi:10.1029/93JA00922.
- Chappell, C. R., K. K. Harris, and G. W. Sharp (1970a), A study of the influence of magnetic activity on the location of the plasmopause as measured byOGO5, *J. Geophys. Res.*, 75, 50, doi:10.1029/JA075i001p00050.
- Darroutzet, F., J. D. Keyser, and V. Pierrard (Eds.) (2009), *The Earth's Plasmasphere: A Cluster and IMAGE Perspective*, Springer, ISBN: 978-1-4419-1322-7, doi:10.1007/978-1-4419-1323-4.
- De Pascuale, S., V. K. Jordanova, J. Goldstein, C. A. Kletzing, W. S. Kurth, S. A. Thaller, and J. R. Wygant (2018), Simulations of Van Allen Probes Plasmaspheric Electron Density Observations, *J. Geophys. Res.*, 123, 9453, doi:10.1029/2018JA025776.
- Denton, R. E., Y. Wang, P. A. Webb, P. M. Tengdin, J. Goldstein, J. A. Redfern, and B. W. Reinisch (2012), Magnetospheric electron density long-term (~ 1 day) refilling rates inferred from passive radio emissions measured by image rpi during geomagnetically quiet times, *J. Geophys. Res.*, 117, doi:10.1029/2011JA017274.
- Elphic, R. C., L. A. Weiss, M. F. Thomsen, D. J. McComas, and M. B. Moldwin (1996), Evolution of plasmaspheric ions at geosynchronous orbit during times of high geomagnetic activity, *Geophys. Res. Lett.*, 23, 2189, doi:10.1029/96GL02085.
- Fraser, B. J., J. L. Horwitz, J. A. Slavin, Z. C. Dent, and I. R. Mann (2005), Heavy ion mass loading of the geomagnetic field near the plasmopause and ULF wave implications, *Geophys. Res. Lett.*, 32, L04102, doi:10.1029/2004GL021315.
- Gallagher, D. L. (2002), IMAGE creates new names to describe invisible cloud features, <http://image.gsfc.nasa.gov/poetry/discoveries/n47.html>.
- Gallagher, D. L., and R. H. Comfort (2016), Unsolved problems in plasmasphere refilling, *J. Geophys. Res.*, 121, 1447, doi:10.1002/2015JA022279.
- Giles, B. L., C. R. Chappell, T. E. Moore, R. H. Comfort, and J. H. Waite, Jr. (1994), Statistical survey of pitch angle distributions in core (0-50 eV) ions from Dynamics Explorer 1: Outflow in the auroral zone, polar cap, and cusp, *J. Geophys. Res.*, 99, 17483, doi:10.1029/94JA00864.
- Goldstein, J. (2006), Plasmasphere Response: Tutorial and Review of Recent Imaging Results, *Space Sci. Rev.*, 124, 203, doi:10.1007/s11214-006-9105-y.
- Goldstein, J., and B. R. Sandel (2005), The global pattern of evolution of plasmaspheric drainage plumes, in *Inner Magnetosphere Interactions: New Perspectives from Imaging*, edited by J. L. Burch, M. Schulz, and H. Spence, p. 1, American Geophysical Union, Washington, D. C., doi:10.1029/159GM01.
- Goldstein, J., R. W. Spiro, P. H. Reiff, R. A. Wolf, B. R. Sandel, J. W. Freeman, and R. L. Lambour (2002), IMF-driven overshielding electric field and the origin of the plasmaspheric shoulder of May 24, 2000, *Geophys. Res. Lett.*, 29(16), doi:10.1029/2001GL014534.
- Goldstein, J., M. Spasojevic, P. H. Reiff, B. R. Sandel, W. T. Forrester, D. L. Gallagher, and B. W. Reinisch (2003a), Identifying the plasmopause in IMAGE EUV data using IMAGE RPI in situ steep density gradients, *J. Geophys. Res.*, 108(A4), 1147, doi:10.1029/2002JA009475.
- Goldstein, J., B. R. Sandel, W. T. Forrester, and P. H. Reiff (2003b), IMF-driven plasmasphere erosion of 10 July 2000, *Geophys. Res. Lett.*, 30, 1146, doi:10.1029/2002GL016478.
- Goldstein, J., R. A. Wolf, B. R. Sandel, and P. H. Reiff (2004), Electric fields deduced from plasmopause motion in IMAGE EUV images, *Geophys. Res. Lett.*, 31(1), L01801, doi:10.1029/2003GL018797.
- Goldstein, J., M. F. Thomsen, and A. DeJong (2014a), In situ signatures of residual plasmaspheric plumes, *J. Geophys. Res.*, 119, 4706, doi:10.1002/2014JA019953.
- Goldstein, J., S. De Pascuale, and W. S. Kurth (2019a), Epoch-based model for plasma-pause location, *J. Geophys. Res.*, 124, doi:10.1002/2018JA025996.
- Goldstein, J., et al. (2014b), Simulation of Van Allen Probes plasmopause encounters, *J. Geophys. Res.*, 119, 7464, doi:10.1002/2014JA020252.
- Goldstein, J., et al. (2018), Imaging the global distribution of plasmaspheric oxygen, *J. Geophys. Res.*, 123, doi:10.1002/2017JA024531.
- Goldstein, J., et al. (2019b), Temperature dependence of plasmaspheric ion composition, *J. Geophys. Res.*, 124, doi:10.1029/2019JA026822.
- Grebowsky, J. M. (1970), Model study of plasmopause motion, *J. Geophys. Res.*, 75, 4329, doi:10.1029/JA075i022p04329.
- Gringauz, K. I., V. V. Bezrukikh, V. D. Ozerov, and R. E. Rybchinskii (1962), The study of interplanetary ionized gas, high-energy electrons and corpuscular radiation of the sun, employing three-electrode charged particle traps on the second Soviet space rocket, *Planet. Space Sci.*, 9, 103, doi:10.1016/0032-0633(62)90180-0.
- Higel, B., and W. Lei (1984), Electron density and plasmopause characteristics at 6.6 earth radii: A

- statistical study of the GEOS 2 relaxation sounder data, *J. Geophys. Res.*, 89, 1583, doi:10.1029/JA089iA03p01583.
- Horwitz, J. L., R. H. Comfort, and C. R. Chappell (1984), Thermal ion composition measurements of the formation of new outer plasmasphere and double plasmopause during storm recovery phase, *Geophys. Res. Lett.*, 11, 701.
- Hull, A. J., C. C. Chaston, J. W. Bonnell, J. R. Wygant, C. A. Keltzing, G. D. Reeves, and A. Gerrard (2019), Dispersive Alfvén wave control of O⁺ ion outflow and energy densities in the inner magnetosphere, *Geophys. Res. Lett.*, 46, doi:10.1002/2019GL083808.
- Lemaire, J. (1975), The mechanisms of formation of the plasmopause, *Ann. Geophys.*, 31, 175.
- Lemaire, J. F., and K. I. Gringauz (1998), *The Earth's Plasmasphere*, Cambridge University Press, Cambridge.
- Lemaire, J. F., and L. Kowalkowski (1981), The role of plasma interchange motion for the formation of a plasmopause, *Planet. Space Sci.*, 29, 469.
- Lemaire, J. F., and V. Pierrard (2008), Comparison between two theoretical mechanisms for the formation of the plasmopause and relevant observations, *Geomagnetism and Aeronomy*, 48, 553, doi:10.1134/S0016793208050010.
- Menietti, J. D., J. L. Burch, and D. L. Gallagher (1988), Statistical study of ion flows in the dayside and nightside plasmasphere, *Planet. Space Sci.*, 36, 693, doi:10.1016/0032-0633(88)90118-3.
- Nagai, T., J. F. E. Johnson, and C. R. Chappell (1983), Low-energy (<100 eV) ion pitch angle distributions in the magnetosphere by ISEE 1, *J. Geophys. Res.*, 88, 6944, doi:10.1029/JA088iA09p06944.
- Nagai, T., J. L. Horwitz, R. R. Anderson, and C. R. Chappell (1985), Structure of the plasmopause from ISEE 1 low-energy ion and plasma wave observations, *J. Geophys. Res.*, 90, 6622, doi:10.1029/JA090iA07p06622.
- Nakano, S., M.-C. Fok, P. C. Brandt, and T. Higuchi (2014a), Estimation of the helium ion density distribution in the plasmasphere based on a single IMAGE/EUV image, *J. Geophys. Res.*, 119, 3724, doi:10.1002/2013JA019733.
- Nakano, S., M.-C. Fok, P. C. Brandt, and T. Higuchi (2014b), Estimation of temporal evolution of the helium plasmasphere based on a sequence of IMAGE/EUV images, *J. Geophys. Res.*, 119, 3708, doi:10.1002/2013JA019734.
- Nishida, A. (1966), Formation of plasmopause, or magnetospheric plasma knee, by the combined action of magnetospheric convection and plasma escape from the tail, *J. Geophys. Res.*, 71, 5669, doi:10.1029/JZ071i023p05669.
- Nose, M., K. Takahashi, R. R. Anderson, and H. J. Singer (2011), Oxygen torus in the deep inner magnetosphere and its contribution to recurrent process of O⁺-rich ring current formation, *J. Geophys. Res.*, 116, A10224, doi:10.1029/2011JA016651.
- Nose, M., et al. (2015), Formation of the oxygen torus in the inner magnetosphere: Van Allen Probes observations, *J. Geophys. Res.*, 120, 1182, doi:10.1002/2014JA020593.
- Nose, M., et al. (2018), Longitudinal structure of oxygen torus in the inner magnetosphere: Simultaneous observations by Arase and Van Allen Probe A, *Geophys. Res. Lett.*, 45, doi:10.1002/2018GL080122.
- Olsen, R. C., C. R. Chappell, D. L. Gallagher, J. L. Green, and D. A. Gurnett (1985), The hidden ion population: Revisited, *J. Geophys. Res.*, 90, 12, doi:10.1029/JA090iA12p12121.
- Omura, Y., M. Ashour-Abdalla, R. Gendrin, and K. Quest (1985), Heating of thermal helium in the equatorial magnetosphere: A simulation study, *J. Geophys. Res.*, 90, 8281, doi:10.1029/JA090iA09p08281.
- Park, C. G. (1974), Some features of plasma distribution in the plasmasphere deduced from Antarctic whistlers, *J. Geophys. Res.*, 79, 169, doi:10.1029/JA079i001p00169.
- Pontius, D. H., Jr. (1997), Coriolis influences on the interchange instability, *Geophys. Res. Lett.*, 24, 2961, doi:10.1029/97GL53157.
- Roberts, W. T., Jr., J. L. Horwitz, R. H. Comfort, C. R. Chappell, J. H. Waite, Jr., and J. L. Green (1987), Heavy ion density enhancements in the outer plasmasphere, *J. Geophys. Res.*, 92, 13499, doi:10.1029/JA092iA12p13499.
- Sandel, B. R., and M. H. Denton (2007), Global view of refilling of the plasmasphere, *Geophys. Res. Lett.*, 34, L17102, doi:10.1029/2007GL030669.
- Sandel, B. R., J. Goldstein, D. L. Gallagher, and M. Spasojevic (2003), Extreme ultraviolet imager observations of the structure and dynamics of the plasmasphere, *Space Sci. Rev.*, 109, 25, doi:10.1023/B:SPAC.0000007511.47727.5b.
- Schulz, M., and H. C. Koons (1972), Thermalization of colliding ion streams beyond the plasmopause, *J. Geophys. Res.*, 77, 248, doi:10.1029/JA077i001p00248.
- Singh, N., and J. L. Horwitz (1992), Plasmasphere refilling: Recent observations and modeling, *J. Geophys. Res.*, 97, 1049, doi:10.1029/91JA02602.
- Singh, N., W. J. Raitt, and F. Yasuhara (1982), Low-energy ion distribution functions on a magnetically quiet day at geostationary altitude L = 7, *J. Geophys. Res.*, 87, 681, doi:10.1029/JA087iA02p00681.
- Sojka, J. J., and G. L. Wrenn (1985), Refilling of geosynchronous flux tubes as observed at the equator by GEOS 2, *J. Geophys. Res.*, 90, 6379, doi:10.1029/JA090iA07p06379.
- Sojka, J. J., R. W. Schunk, J. F. E. Johnson, J. H. Waite, and C. R. Chappell (1983), Characteristics of thermal and suprathermal ions associated with the dayside plasma trough as measured by the dynamics explorer retarding ion mass spectrometer, *J. Geophys. Res.*, 88, 7895, doi:10.1029/JA088iA10p07895.
- Sojka, J. J., G. L. Wrenn, and J. F. E. Johnson (1984), Pitch angle properties of magnetospheric thermal protons and satellite sheath interference in their observation, *J. Geophys. Res.*, 89, 9801, doi:10.1029/JA089iA11p09801.
- Su, Y.-J., M. F. Thomsen, J. E. Borovsky, and D. J. Lawrence (2001), A comprehensive survey of plasmasphere refilling at geosynchronous orbit, *J. Geophys. Res.*, 106, 25625.
- Thaller, S. A., et al. (2015), Van Allen Probes investigation of the large-scale duskward electric field and its role in ring current formation and plasmasphere erosion in the 1 June 2013 storm, *J. Geophys. Res.*, 120, 4531, doi:10.1002/2014JA020875.
- Thaller, S. A., et al. (2019), Solar Rotation Period Driven Modulations of Plasmaspheric Density and Convective Electric Field in the Inner Magnetosphere, *J. Geophys. Res.*, 124, 1726, doi:10.1029/2018JA026365.
- Young, D. T., S. Perraut, A. Roux, C. de Villedary, R. Gendrin, A. Korth, G. Kremser, and D. Jones (1981), Wave-particle interactions near Omega/He plus/observed on GEOS 1 and 2. I: Propagation of ion cyclotron waves in He/plus/-rich plasma, *J. Geophys. Res.*, 86, 6755, doi:10.1029/JA086iA08p06755.
- Yue, C., et al. (2017), The Characteristic Pitch Angle Distributions of 1 eV to 600 keV Protons Near the Equator Based On Van Allen Probes Observations, *J. Geophys. Res.*, 122, 9464, doi:10.1002/2017JA024421.