

Lightning in the Ionosphere and Magnetosphere

Intended for Energetic Radiation from Thunderstorms and Lightning, or possibly for Distant Electromagnetic Environment Produced by Lightning session

Robert H. Holzworth, Michael P. McCarthy, Abram R. Jacobson, Michel L. Hutchins and Hao Zheng, (Earth and Space Sciences, University of Washington, Seattle, WA 98195-1310, USA, bobholz@uw.edu), R. F. Pfaff (NASA GSFC), J. R. Wygant (U. Minnesota), F. S. Mozer (U. C. Berkeley), James B. Brundell (Ultra MSK, New Zealand), George Hospodarsky (U. Iowa)

Electromagnetic radiation from lightning is well known to affect the ionosphere and magnetosphere. Using the World Wide Lightning Location Network (WWLLN), multiple ground-based wideband VLF recordings, wideband vector field measurements on the C/NOFS (Communications/Navigation Outage Forecast System) satellite in the ionosphere, and separately on the Van Allen Probes (originally named the Radiation Belt Storm Probes or RBSP), we have tracked thousands of individual sferics, from known lightning source locations, to the satellites, allowing a direct propagation study of the transmission through the ionosphere, including stimulated emissions, and the propagation as oblique whistler waves to the satellites. The satellite data were not taken simultaneously, although that possibility now exists for the coming year. This paper will review the new results from this study relating to the energy coupling into and through the ionospheric and magnetospheric plasmas, and the global distribution of these waves in the magnetosphere.