

AAE Spring 2013 Special Seminar

Weakly-ionized Plasma Processes in the Upper Atmosphere

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Abstract

The present state of electrical phenomena and related transient luminosity events (TLE) in the upper atmosphere will be presented: observations, manifestations and possible explanations. Beautiful natural phenomena Red Sprites, Blue Jets and Gigantic (Blue) Jets are of great interest to many researchers. Red sprites are large scale weakly ionized nonequilibrium electrical discharges that occur high above thunderstorm clouds, spanning the altitude range 50 to 90 kilometers above the Earth's surface. Blue jets the name given to a transient luminosity events growing upward with a speed of about 100 km/s from the upper boundary of a thundercloud. Theoretical models and possible small-scale laboratory experiments of red sprites and blue jets will be discussed.

Bio

Dr. Mikhail N. Shneider received a master's degree in theoretical physics (with honors) from the Kazan State University, Russia, a Ph.D. in Plasma physics and Chemistry from All-Union Electrotechnical Institute, Moscow and Doctor of Sciences (highest scientific degree in Russia) in Plasma physics and Chemistry from Institute for High Temperatures, Russian Academy of Sciences, Moscow. Since 1998 until the present, Dr. Shneider has been working at the Mechanical and Aerospace Engineering Department, Princeton University. At present he is a Senior Scientist in the Applied Physics Group. His research interests are in the theoretical study of gas discharge physics; physical gasdynamics; atmospheric electrical phenomena; non-linear optics and laser-matter interaction. Dr. Shneider has more than 130 papers in refereed journals (7 review papers) and one book.

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