

Space Science Seminar

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The Physics of Sprites

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Transient Luminous Events (TLEs) are naturally-occurring electrical discharges in the upper atmosphere above thunderclouds and can extend in altitude to the base of the E-region ionosphere (Altitude \cong 90km). In particular, sprites are a class of TLEs triggered by the mesospheric electric fields that exceed the breakdown threshold for air configuration often resulting from cloud-to-ground (CG) strikes of tropospheric lightning. The primary emissions of sprite-generated flashes are in the visible spectrum, but because they are short-lived (up to 10s of ms) and relatively unpredictable, several decades of anecdotal reports (e.g. by pilots) went unexplained that is, until in 1989 when a TLE was serendipitously captured by a low light level TV camera undergoing tests for sounding rocket integration. Since then, dozens of campaigns and hundreds of papers have been completed on the topic. This seminar will cover the progress in understanding the physical mechanisms of sprites and the features that distinguishes them from other forms of TLEs.



<http://solarscience.msfc.nasa.gov/SpaceScienceSeminars.html>