



Mesospheric runaway breakdown in LF radio

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Particularly intense positive lightning discharges can cause transient luminous events (TLEs) in the mesosphere, denoted sprites. These sprites are the luminous manifestation of breakdown in the mesosphere. Two types of mesospheric breakdown have been proposed: Conventional breakdown and relativistic runaway breakdown. Whilst conventional breakdown results from the quasi-static heating of the neutral gas in the mesosphere, relativistic breakdown is associated with an avalanche of relativistic electrons which produce broadband low frequency electromagnetic radiation (LF radio). This contribution uses a numerical model to calculate the electric field of an average sprite resulting from relativistic breakdown and compares the result to actual measurements of the natural atmospheric electromagnetic environment at low frequencies from 5 Hz to 500 kHz.