



## **Large scale luminosity characteristics of sprites observed over a South African thunderstorm**

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The South African Astronomical Observatory in Sutherland, South Africa, provides an excellent vantage point for sprite observations, combining low ambient light surroundings with a relatively clean ELF radio spectrum. A thunderstorm 600 km to the North of the observatory produced 23 captured sprites during the evening of the 24 Jan 2017, recorded with a video camera and ELF radio receiver. The video camera was set up to detect a range of intensities without saturating. The image processing extracted sprite luminosities which reveal two distinct sprite types, distinguished by brighter sections either above or below approximately 55 km altitude. This novel appearance of both “high” (luminosity concentrated from 55 km to 75 km altitude) and “low” (luminosity concentrated from 25 km to 55 km altitude) type sprites warrants further study to characterise and model causative factors. Simultaneous measurements with a wide-bandwidth low-frequency radio receiver provide useful information on the radiated electric field strength generated, and lightning flash data sourced from the commercial weather service Earth Networks provides characteristics of the sprite initiating lightning stroke. These results provide impetus for further development of the theory to describe the appearance of sprites.