

THE RESULTS FROM THE 1999 SPRITES BALLOON CAMPAIGN

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A balloon campaign was conducted in summer, 1999, to measure the stratospheric electromagnetic fields associated with sprites. This paper will summarize some of the salient results this work. The balloon payloads were instrumented with electric field detectors, magnetometers, an upward looking photometer, and other instruments. Ground observations for detection of sprites included low light level TV (LLTV) observations from three sites, Jelm Mt., WY, Bear Mt., SD, and Yucca Ridge, CO. The disagreements between models and these data will be discussed. The all-sky upward looking photometer data was examined by checking the trace at the times of cloud to ground (CG) strokes reported by the US National Lightning Detection Network (NLDN) to find transient luminous events (TLE's) that were missed visually. In total numbers, the number of -CG TLE's (presumably all halos) predominates over the number of +CG TLE's. 3602 events were analyzed in 4.1 hours of storm time. Threshold current moments of ~50 kA-km for the positive cloud to ground (+CG) TLE's and ~-5 kA-km for negative cloud to ground (-CG) TLE'S are found. Inclusion of the -CG events that are not seen from the ground raises mesospheric power input estimates by a factor of ~5-7. Including the mesospheric effect of CG's not associated with TLE's increases this estimate by a factor of 20.