# IN-SITU AND GROUND-BASED INVESTIGATIONS OF SPRITE ENERGETICS OVER SOUTHERN BRAZIL

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In November, 2002, and March, 2003, two campaigns were conducted over southeastern Brazil to investigate the presence and characteristics of transient luminous events (TLE), which are associated with positive lightning discharges. Two stratospheric balloons were flown directly over large, active thunderstorms and we recorded EM data on the largest electric field transients from positive lightning ever obtained over thunderstorms above 30 km. Optical measurements, using intensified CCD video cameras equipped with GPS timing, were also made from a field station at Cachoeira Paulista (23S, 45W), and from an Embraer aircraft (both operated by the Instituto Nacional de Pesquisas Espaciais; INPE). These observations provided the first quantitative measurements of sprites over Brazil, nevertheless, the weather conditions prevented simultaneous in-situ and optical observations. In order to continue our investigations, a new balloon campaign will be conducted in February-March, 2005, from Santa Maria (29.7S, 53.8W), Rio Grande do Sul, in order to fly over some of the largest storms in the world (over southern Brazil and northern Argentina). In addition to the previous electronic and optical capabilities, two major improvements have been developed: video imaging from the balloon itself, and the addition of a down-range telemetry receiving station for accessing more distant sprite-active thunderstorms. Charge moment changes and related lightning parameters will be measured using local ground based extremely- and very low frequency electric and magnetic field sensors (from Duke University), and lightning timing and location will be provided by the Brazilian lightning detection network. This talk will summarize the previous campaign measurements and will discuss the planned new observations.

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3. (a)

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