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Sprites research in South America: the LATINELT network

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South America's combination of intense thunderstorm activity and geomagnetic characteristics creates a unique natural laboratory for investigating a variety of atmospheric phenomena and their possible coupling. Its large latitudinal extent, from ~12o N to ~55o S, encompass equatorial, tropical and subtropical regions with meteorological conditions that makes South America the second most active thunderstorm and lightning, and consequently one of the most active Transient Luminous Events (TLEs) region of the globe. TLEs are optical emissions from transient plasma discharges excited in the upper atmosphere by the electromagnetic field of underlying lightning flashes from thunderstorms. Since 2002, five different campaigns have been performed in Brazil to make TLE observations, more than 700 events, mainly sprites, have been recorded over South American thunderstorms during Brazilian campaigns so far. During the first campaign, in 2002/2003, 18 sprites were recorded above Minas Gerais State in two different nights; 11 sprites from 3 different storms above Goias and Mato Grosso States was the total recorded on a single night of the second campaign, in 2005. The third campaign, in 2006, had the impressive record of more than 600 TLEs from two thunderstorms, over Argentina and Paraguay, in different nights. In 2007 we recorded 27 sprites from a single system above Uruguay, and in 2008, 13 TLEs were registered above one convective system over Rio Grande do Sul State. This paper will review the main results of these observations. It will also introduce the Transient Luminous Event and Thunderstorm High Energy Emission Collaborative Network in Latin America –LEONA. The network has two prototype observation camera system already installed in Brazil and will be developed to cover the whole South America.

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