

Thunderstorms and lightning activity in São Paulo metropolitan area during CHUVA-GLM Vale do Paraíba field experiment

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During the months of November of 2011 through March of 2012, the fourth field CHUVA was conducted at Vale do Paraíba in São Paulo, Brazil (see <http://chuvaproject.cptec.inpe.br/>), the so called CHUVA-Geostationary Lightning Mapper (GLM) Vale do Paraíba. CHUVA-GLM Vale was a joint project coordinated by Instituto Nacional de Pesquisas Espaciais (INPE) and Universidade de São Paulo (USP), with collaborations from NOAA, NASA, EUMETSAT, DLR, and several other national and international institutions and organizations. In addition to the characterization of the precipitating systems in Southeast Brazil, this specific field experiment also collected lightning proxy data for the upcoming geostationary lightning imagers (GOES-R GLM and MTG LI) using 10 lightning locating systems (LLS) (Figure 1) including LMA, LINET, TLS200, ENTLN, RINDAT, STARNET, WWLLN, GLN, ATDnet, and GLD360, high-speed cameras, and the Lightning Imaging Sensor (LIS) on the Tropical Rainfall Measuring Mission (TRMM) satellite.

CHUVA-GLM provided a comprehensive database of thunderstorm development and characteristics for the first time in Brazil, where a large variety of cloud systems were sampled: cold fronts, squall lines, the South Atlantic Convergence Zone (SACZ) and local convective systems. Microphysical characteristics (such as hydrometeor identification and ice/water mass) of these summer 2011-2012 precipitating systems can be inferred from the X-Pol and 3 operational S-band radars, and the LLS provide detailed information about the storms electrical activity (such as charge centers and lightning propagation processes). We will summarize the results from this experiment providing a study of the relationship between the storm type and its microphysical-electrical characteristics.

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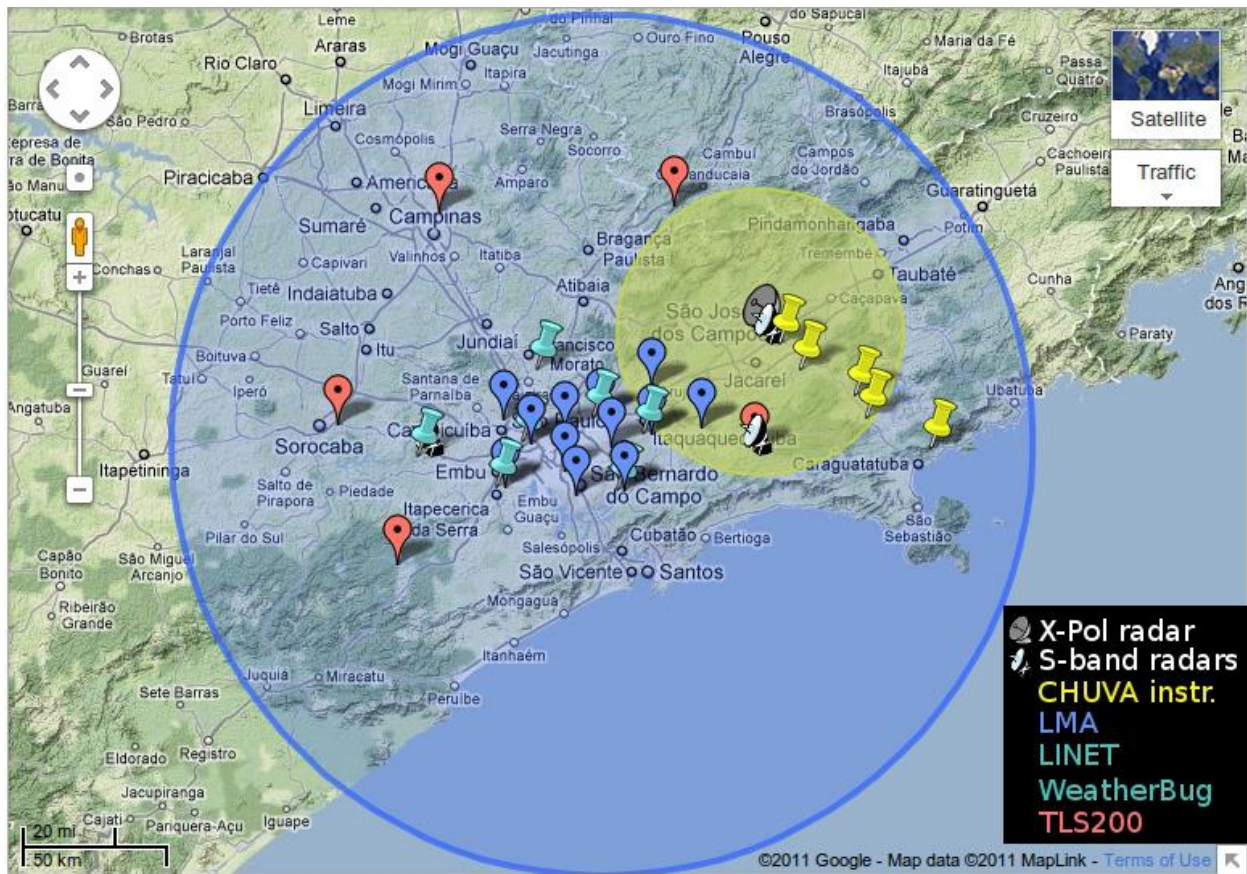


Figure 1 – CHUVA-GLM Vale do Paraíba field campaign experiment coverage and instruments. Blue, pink and cyan pins represent the 4 total (intracloud and cloud-to-ground) lightning deployed for this experiment. Yellow pins are the CHUVA sites with disdrometers, pluviometers, radiometers, lidars, etc. The yellow circle is the Dual-Pol X-band radar 50km coverage area, and the blue circle is the SPLMA 250km coverage.

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