



Lightning and hydrometeorological observations of severe weather events in Brazil

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Integrated information from weather radars, lightning detection and satellite systems are the primary tools for severe thunderstorm analysis and nowcasting. The combination of radar products such as reflectivity and precipitation estimates with lightning data and satellite images provides improved thunderstorm identification and analysis of storm characteristics and life cycle.

Recent studies of total (intracloud and cloud-to-ground) lightning observations have shown that although equatorial Africa stands out as the most active lightning region on Earth, the most violent and extreme lightning storms are more concentrated in the subtropic to the extratropics. In South America, southern parts of Brazil and northeastern Argentina are regions particularly prone to severe weather events (high lightning activity, intense precipitation, hail, flash floods, strong winds and tornadoes)

This paper presents results of the analysis of electrical and hydrometeorological characteristics of severe storms, specially with hail and intense precipitation observations during events in the south of Brazil. The set of storms presented here have no indication of tornadoes. However, other cases will be investigated in the future to analyze more carefully these severe weather events. Although predominantly negative CG mesoscale convective systems are common, positive CG storms such as the leading line trailing stratiform squall line presented here are related to strong severe weather events and are not uncommon in this region.

With this work, we expect to have a better understanding and improvement of our forecasting abilities related to those storms with strong precipitation and lightning. The integration of observation systems in an operational environment such as described in this paper is the initial step to achieve these goals.