

Lightning location system detection efficiency of negative cloud-to-ground strokes containing continuing current

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ABSTRACT: Continuing current (CC) is the continuous mode of charge transfer to ground in a flash. The extent to which the CC contributes to the total negative charged lowered to earth is large. They are not only responsible for most serious lightning damage associated with thermal effects, but they also play an important role in the NO_x atmospheric balance and possibly other phenomena. In this study we analyze how the detection of negative cloud-to-ground (CG-) lightning strokes by lightning location systems is affected by the duration of the following CC, when present. A previous study has indicated a decrease in detection efficiency for strokes followed by a long CC (i.e., cases that lasted more than 40 milliseconds) but did not expand the analysis for different ranges of durations. In order to make this investigation, we use digital high-speed video records of hundreds of flashes observed in Brazil combined with data given by the Brazilian Lightning Location System (BrasilDat). Considering that previous studies observed that long CC are not preceded by high peak current values, this work can also be used to evaluate the detection efficiency of lightning detection networks that depend on the intensity of the return stroke.

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