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# Cloud-to-ground lightning activity in Colombia: A 14-year study using lightning location system data

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## Abstract

This paper presents the analysis of 14 years of cloud-to-ground lightning activity observation in Colombia using Lightning Location Systems (LLS) data. The first Colombian LLS operated from 1997 to 2001. After a few years, this system was upgraded and a new LLS has been operating since 2007. Data obtained from these two systems was analyzed in order to obtain lightning parameters used in designing lightning protection systems. The flash detection efficiency was estimated using average peak current maps and some theoretical results previously published. Lightning flash multiplicity was evaluated using a stroke grouping algorithm resulting in average values of about 1.0 and 1.6 for positive and negative flashes respectively and for both LLS. The time variation of this parameter changes slightly for the years considered in this study. The first stroke peak current for negative and positive flashes shows median values close to 29kA and 17kA respectively for both networks showing a great dependence on the flash detection efficiency. The average percentage of negative and positive flashes shows a 74.04% and 25.95% of occurrence respectively. The daily variation shows a peak between 23 and 02 hours. The monthly variation

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