Comparisons between triggered and natural lightning flashes observed in Brazil

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The objective of this work is to perform natural and triggered lightning measurements using different kinds of equipment: a high-speed digital camera, which acquires data with a time resolution up to 125 microseconds (8,000 frames per second) and is coupled to a GPS system; and an optical sensor with 10 nanoseconds resolution. The measurements will be supported by a LPATS-IMPACT network. The data will be analyzed and compared in order to characterize the flashes in terms of duration of long and short-term current pulses, luminosity, multiplicity, polarity, stroke peak currents and interstroke intervals. In addition, the temporal resolution of the camera provides results on leaders morphologies and attachment processes. The triggered lightning experiments have been made since the summer of 2000 at the International Center for Triggered and Natural Lightning in Brazil (Cachoeira Paulista, S 22° 41.2; W 44° 59.0; altitude: 625 m). The discharges are artificially initiated by the "altitude" and the "classical" techniques. The triggered lightning results also include current waveforms with a sample rate of 100 nanoseconds. The data obtained, both on triggered and natural flashes, will bring new information about the physical processes involved in tropical lightning.