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E1-24: Preliminary results of implementing an automated system in Sri Lanka to locate lightning ground flashes

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In this paper we report the first results of an ongoing project of implementing a lightning locating (LL) system (LLP inc., USA) consisting of four direction-finding (DF) stations. Each DF station of an LL system consists of two orthogonal wide band loop antennas and a set of horizontal plates together with the necessary electronics to sense the magnetic and electric fields generated by the lightning discharge. Only the signals the having the characteristic signature of the return-strokes of ground flashes are selected by filtering out cloud discharges and any background interference. Each DF station provides information of the time of a lightning discharge, the azimuthal angle of the flash, the normalised field strength of the first return stroke and the total number of strokes in the flash.

Two DF stations were positioned in the close vicinity of each other and the records of ground flash parameters obtained during the months of April and May, 1998 were compared. The main criterion used in selecting the lightning discharge was the time of strike. All discharges that were not recorded within 100ms by both DF stations were rejected. Any consecutive recordings within 200ms were discarded during analysis to eliminate problems due to pulse pile-up effects. Only about 3% of the discharges were located with incorrect angles when operated under severe storm weather conditions. Further the analysis of recorded data show that it is possible to identify discharges occurring from two separate electrical activity centres. The range of the system was found to be sufficient to locate lightning in any part of Sri Lanka and in the surrounding area of the Indian Ocean.

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