E1-50: Some features of thunderstorm activity in Sri Lanka

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Thunderstorm and lightning occurrence data are of utmost importance in lightning protection to calculate the risk index and determine the level of protection needed. The incidence of lightning in Colombo, was monitored over a period of 4 years from June 1994 to May 1998 covering 8 thunderstorm seasons. Measurements were made continuously during this period using CGR3 Mackerras type lightning flash counter with its 3.3 m long vertical antenna mounted on the roof top of a 14 m tall building. The counter has the capability to register Negative Ground Flashes, Positive Ground Flashes and Cloud flashes within a range of 14 km, and all types of lightning flashes within a range of 40 km.

A total of 18162 ground flashes transporting both the positive and negative charge to the ground were registered within a radius of 14 km from the Colombo

station during this 4 year period. The amount of all types of lightning flashes registered during this period within 40 km range was 197403, which includes both the cloud and ground flashes. This data was analysed to represent graphically the monthly variation of lightning activity in each year. The highest lightning activity observed was from the thunderstorms in April/May and October/November periods. The ground flash density calculated for the years 1995, 1996 and 1997 were 8.44, 6.25 and 9.91 flashes km^{-2} $year^{-1}$.

Four years data were not sufficient to produce a meaningful value for the average lightning activity for each month as the activity increased dramatically in certain years. These peaks were observed in April, 1998 and October, 1997 with a number of ground flashes within 14 km being 2621 and 2618 and number of total flashes within 40 km being 41225 and 15187, respectively. The comparatively high number of ground flashes and less number of total flashes observed in October 1997 period indicates that the thunderstorm season at the onset of a El Nino year is more hazardous due to the presence of more ground flashes that cause damage to persons and properties. The results also indicate that the increased lightning hazards reported in the recent past were actually due to the increased occurrence of lightning discharges to ground and in particular during the years 1995 and 1997.

Financial assistance by NARESA(Research grant RG/95/P/02)is acknowledged.