



## **Day-of-the-week variability of the total lightning activity in the urban area of Paris, France**

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Some recent studies have shown a modification of the lightning activity over urban areas (Wescott, 1995; Orville et al., 2001; Soriano and Pablo, 2002). In particular, an increase in the CG flash density and a decrease in the percentage of positive CG flashes are observed (Steiger et al., 2002; Naccarato et al., 2003; Pinto et al., 2004). Two possible kinds of explanation are commonly proposed: on one hand, the urban heat island could favour convection and enhance lightning activity; and on the other hand, the aerosols, which behave as cloud condensation nuclei, could alter the cloud drop spectra and thus affect the electrification process. The different topographic features in and around cities could also play a part. As it is very difficult to isolate each parameter, the relationship between urban areas and lightning activity is not clearly understood. Furthermore, no study has considered the intra-cloud flashes behaviour.

A statistical study of lightning activity has been realised in a  $200 \times 200$  km<sup>2</sup> area around Paris (France). Twelve summers (1992-2003) of CG lightning data and 5 summers (1997-2001) of IC lightning data were available. We separated weekdays and weekends in order to observe different urban activity conditions (more anthropogenic activity on weekdays than on weekends). The results show a higher number of CG flashes per day on weekdays than on weekends. The mean percentage of positive CG flashes seems to be lower on weekdays. However, there is nothing remarkable concerning CG peak currents and multiplicities. As far as IC flashes are considered, the activity appears more important on weekdays than on weekends but the difference is less significant than in the case of CG flashes. Several parameters that could be at the origin of this day-of-the-week variability are examined (temperature, humidity, concentrations in pollutants...).

References:

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