



Cloud to Ground characteristics of Western Mediterranean mesoscale convective systems

F. Correoso, E. Hernández, R. García-Herrera, D. Paredes, D. Barriopedro

Dept. Física de la Tierra II, Facultad de CC. Físicas, Universidad Complutense de Madrid,
Spain (kiko@fis.ucm.es / Phone: +34 913944490 / Fax: +34 913944635)

The Cloud-to-Ground (CG) lightning activity of Mesoscale Convective Systems (MCSs) developed over the Western Mediterranean is analysed. For this purpose we have used a dataset of 33 MCSs detected during the period 2000-2002 using infrared satellite imagery. Firstly, the study of the whole MCS dataset shows a high percentage of positive CG lightning flashes. Also, there are high values of negative CG flashes multiplicity during the MCSs life cycle. However, the mean peak current is considerably lower compared to the values obtained from previous studies over the same area. Some other statistical values are obtained from the dataset, which include 22% of the positive CG ratio, 1.1 (2.4) for the positive (negative) CG multiplicity, 17 kA (22.6 kA) of the peak current for the positive (negative) CG flashes and a mean flash rate of around 13 min^{-1} .

In spite of the large disparities detected in a case-to-case analysis among the MCSs in the database some general conclusions are obtained. Firstly, most of the MCSs present the highest rates of CG lightning flashes during their growing stage, this is, before or during the MCS largest area record, although positive CG flashes usually reach their maximum rate before the negative ones. Also, the maximum flash rate usually coincides with the minimum cloud top temperatures, thus, the area enclosed by the lowest temperatures in the MCS display a higher flash density than the surroundings.