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Cloud-to-ground lightning activity in Romania from 2003 to 2005

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The geographical distributions of cloud-to-ground lightning strikes recorded by the National Lightning Detection Network over contiguous Romania for the years 2003-2005 are presented. These characteristics include: total cloud-to-ground flash density, the positive flash density, the percentage of positive flashes, and diurnal and monthly variation of the total number of discharges. Analysis was carried out at 0.2˚ space resolution, corresponding to about 20-km resolution. Maximum density tops 9 discharges km^{-2}in Olteniei Plain and Jiu's Defile areas, situated in the southern part of Romania. The monthly mean number of discharges reached a maximum of about $12.5 \cdot 10^4$ flashes in July. Maximum density of positive cloud-to-ground strikes, higher than 0.08 discharges km^{-2}, was recorded around the cities of Barlad and Suceava, North-Eastern part of Romania. The monthly mean number of positive discharges has a main maximum corresponding to July and a secondary one in May. High values of the annual mean percentage of positive cloud-to-ground flashes are specific to Eastern Romania regions. Monthly mean positive discharge percentage varies between 2% in July and 18% in January. Diurnal variation of discharges has the same characteristics over the year, with a maximum within 1600-1800 TL. When the relationship between lightning activity and ETOPO-2 topographic measurements, at 0.2˚ x 0.2˚ resolution, is analyzed, a decrease with altitude can be noticed in total number of discharges. The proximity sounding method was applied in order to point out the physical processes leading to cloud-to-ground lightning flashes.