



## **A Cloud-to-Ground Lightning Climatology for North- Eastern Italy**

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This study analyzes the characteristics and spatial distribution of cloud-to-ground lightnings (C2G) in an area covering North-Eastern Italy and part of Austria, Slovenia and Croatia. The dataset consists of about 6.5 millions of C2G flash records, both positive and negative, observed between January 1995 and December 2011 by the Centro Elettrotecnico Sperimentale Italiano-Sistema Italiano Rilevamento Fulmini (CESI/SIRF) in the European Cooperation for Lightning Detection (EUCLID) Network. The spatial analysis is done with a resolution of  $0.03 \times 0.02$  deg (gridboxes covering an area of about  $5.15 \text{ km}^2$ ) in the domain between  $44\text{N}$ - $48\text{N}$  deg of latitude and  $10\text{E}$ - $15\text{E}$  deg of longitude.

It results that C2G concentrates in the foothill regions in the southern flank of Oriental Alps with a maximum of discharge frequency between 5 and 10 flashes per  $\text{km}^2$  per year. The "active season" of lightning starts in April and lasts through November with the highest number of C2G strokes occurring during the summer months of July and August. The spatial and temporal distributions show a dependence on the topography, therefore the analysis is divided into three selected zones according to the topography: the coastal area (height between 0-5m), the internal/foothill area (height between 5m-400m) and the "mountain" region (everything above 400m). The spatial and temporal features of C2G in the three different regions are discussed evidencing a late summer concentration of flashes along the coastal region, affected by the instability created by warm sea surface temperature especially during the evening, and a June through August concentration in the mainland with a very different diurnal cycle, peaking around 16 UTC.