



Analysis of the variability of lightning occurrence over the Italian territory.

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A wide collection of lightning data acquired by the lightning network LAMPINET is analyzed. The network, which can reach a detection efficiency of 90% for peak current greater than 50 kA and location accuracy of 500 meters over all Italian and surrounding area, has allowed the possibility of investigating some properties of the lightning occurrence in Italy. Considering the Italian territory surrounded by a significant and representative portion of Mediterranean Sea, it has been shown that the Ground Flash Density (GFD) of Cloud to Ground (CG) flashes is about 3 flashes/km² on the sea with a ratio between negative and positive strokes of the order of about 3.7. On the other hand, the land experiences a higher GFD (about 3.5 flashes/km²) with a slightly higher ratio between negative and positive strokes (about 3.8). Moreover, for both positive and negative strokes, the highest GFD occurs between June and August on the land and between August and October on the sea. The highest concentration of lightning on the land occurs between 11 AM and 4 PM, while the GFD is almost constant along the day over the sea.

Furthermore, on the basis of previous literature that has justified the use of lightning location systems to infer parameters of lightning current statistical distributions from measured fields alone, some evaluations concerning mean values of the peak current for positive and negative flashes have been performed and an empirical probability density function of such peak has been estimated.