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Spatial and temporal variability of lightings over Greece

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Lightings are the most powerful and spectacular natural phenomena in the lower atmosphere, being a major cause of storm related deaths. Cloud-to-ground lightning can kill and injure people by direct or indirect means. Lightning affects the many electrochemical systems in the body causing nerve damage, memory loss, personality change, and emotional problems. Besides, among the various nitrogen oxides sources, the contribution from lightning likely represents the largest uncertainty.

In this study, the spatial and temporal variability of recorded lightings over Greece during the period from January 1, 2008 to December 31, 2009, were analyzed. The data for retrieving the location and time-of-occurrence of lightning were acquired from Hellenic National Meteorological Service (HNMS) archive dataset. An operational lighting detector network was established in 2007 by HNMS consisted of eight time-of-arrival sensors (TOA), spatially distributed across Greek territory.

The spatial variability of lightings revealed their incidence within specific geographical sub-regions while the temporal variability concerning the seasonal, monthly and daily distributions resulted in better understanding of the time of lightings' occurrence. All the analyses were carried out with respect to cloud to cloud, cloud to ground and ground to cloud lightings, within the examined time period.