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# Spatio-temporal activity of lightnings over Greece

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Extreme precipitation events are always associated with convective weather conditions driving to intense lightning activity: Cloud to Ground (CG), Ground to Cloud (GC) and Cloud to Cloud (CC). Thus, the study of lightnings, which typically occur during thunderstorms, gives evidence of the spatio-temporal variability of intense precipitation.

Lightning is a natural phenomenon in the atmosphere, being a major cause of storm related with deaths and main trigger of forest fires during dry season. Lightning affects the many electrochemical systems of 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.

An operational lightning detection network (LDN) has been established since 2007 by HNMS, consisting of eight time-of-arrival sensors (TOA), spatially distributed across Greek territory. In this study, the spatial and temporal variability of recorded lightnings (CG, GC and CC) are analyzed over Greece, during the period from January 14, 2008 to December 31, 2009, for the first time. The data for retrieving the location and time-of-occurrence of lightning were acquired from Hellenic National Meteorological Service (HNMS). In addition to the analysis of spatio-temporal activity over Greece, the HNMS-LDN characteristics are also presented.

The results of the performed analysis reveal the specific geographical sub-regions associated with lightnings incidence. Lightning activity occurs mainly during the autumn season, followed by summer and spring. Higher frequencies of flashes appear over Ionian and Aegean Sea than over land during winter period against continental mountainous regions during summer period.