Lightning climatology over the eastern Mediterranean

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In the frame of TALOS project, the lightning activity for a 10-year period (2005–2014) over the eastern Mediterranean (16–320E, 34–460N) is analysed. The study is based on the use of cloud-to-ground lightning activity data from ZEUS system, a Very-Low-Frequency Lightning detection network operated by the National Observatory of Athens. The spatial and temporal (seasonal and diurnal) variability of the lightning activity is examined.

Lightning is modulated by the diurnal cycle of insolation and the underlying topographic features of the region. CG lightning activity is dominant over land and coastal areas during summer and spring, while during the cold period of the year is dominant over the sea and is significantly stronger over the mainland than over the sea. The maximum of the lightning activity is observed in June and mostly in the afternoon. The CG variability is consistent with the global lightning activity observations. The effect of elevation, terrain slope and vegetation on the distribution of the CG flashes is also investigated. The orography and the terrain slope favour the lightning activity. Throughout the year, the potential of producing CG flashes ("lightning yield") over bareground is low while during the warm period of the year, the forested areas have increased "lightning yield".

Additional analysis focuses on the links of CG lightning with indices related with the atmospheric instability such as the Convective Available Potential Energy (CAPE). CAPE is known as the driving force for thunderstorm development. The analysis showed that the lightning density increases with increasing values of CAPE.