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Observational- and modeling-based study of Mediterranean thunderstorms

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We will present a detailed analysis of Mediterranean storms based on observations and modeling work.

We will use the mesoscale model MM5 to investigate the development f the systems on the large scale. We will also run the1.5-D EMTM (Explicit Microphysics Thunderstorm Model), developed at University of Washington, to simulate the convective cells of the storm and to infer microphysical cloud properties. The outputs from both MM5 and EMTM models (microphysics and dynamical quantities, lightning type and flash rates, vertical cloud profiles) will be compared to observations collected by different space borne and ground based sensors.

In particular we will make use of satellite observations from TRMM Lightning Imaging Sensor (LIS) to determine the total lightning activity. Measurements from the Precipitation Radar (PR) will be analyzed to document the vertical structure of the cloud system. Finally the TRMM Microwave Imager (TMI), especially at 85 GHz, for retrieving information about the amount of ice in the upper levels. Other Meteosat, SSMI or AMSR observations will be also used to document the studied storms.

Because the space borne observations from low orbit satellites will give us only snapshots of the cloud system during the different satellite overpasses, other ground based measurements will be used to performed the temporal validation of the modeled outputs. Observations of the National Observatory of Athens (NOA) long-range VLF ZEUS sensor will be available for this study, as well as raingauge data.