

STSM Scientific Report

From Savka Petrova

The topic of my PhD thesis is “Relation between lightning activity and precipitation”. For my investigation lightning data are necessary to be used. For this reason I visited the National Observatory of Athens (NOA) for one week (4 June-11 June 2006).

The main purpose of my visit was to understand how to deal with the lightning data recorded by the ZEUS system operated by NOA. ZEUS is a long-range lightning network, developed and installed in Europe by Resolution Display Inc. (RDI) for NOA, that continuously monitor lightnings over large regions by means of the radio noise that is emitted in the Very Low Frequency (VLF) range of 5 to 15 kHz, yielding information on complex characteristic of convective cloud systems. The network provides lightning measurements from five stations located at: Larnaca (Cyprus), Lisbon (Portugal), Birmingham (UK), Roskilde (Denmark), and Iasis (Romania). This configuration has the ability to monitor lightning over the whole Europe and the Mediterranean.

During my visit, the colleagues from Greece presented to me the ZEUS system, the type of information given in the ZEUS records as well as the data format.

They show me how to use GrADS (Grid Analysis and Display System), which I can use for the visualization of different lightning characteristics. They prepared a code for visualization of lightning numbers at different hours and for lightning density for a fixed location (longitude 10°W-40°E, latitude 30°S - 50°N).

The data ZEUS for period April to September 2005 year was given to me. This period is very interesting, because during this time there were several heavy precipitation and hail thunderstorms over Bulgaria. And usually during this period of the year there are a lot of lightning in Bulgaria. We discussed to study the difference between lightning characteristics over Bulgaria, Greece and part of Mediterranean.

They showed me also sites with information for precipitation and lightning from satellite, which may be use in a future.

My work with the colleagues from Greece is very usefull and important for me, because part of my PhD work is to examine the relation between lightning activity and precipitation for the proper geographical region (Mediterranean, Greece and Bulgaria). The visit to Nationality Observation of Athens was helpful for the progress in the investigations of my PhD dissertation.

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