



## **Cyclones contribution to dust transport over the Mediterranean region**

Emmanouil Flaounas (1), Vassiliki Kotroni (1), Konstantinos Lagouvardos (1), Stelios Kazadzis (1), Antonis Gkikas (2), and Nikolaos Hatzianastassiou (3)

(1) National Observatory of Athens, Athens, Greece, (2) Earth Sciences Department, Barcelona Supercomputing Center, Barcelona, Spain, (3) Laboratory of Meteorology, Department of Physics, University of Ioannina, Greece

One of the major cyclogenetic areas in the Mediterranean region is located over the north west African continent, at the proximity of the Atlas mountain. While cyclogenesis takes place over this area, heavy dust loads are uptaken due to the strong winds and are transferred over the Mediterranean basin. In many case studies, dust is observed to be trapped within the cyclones' mesoscale vortex and to be transferred in long distances along the cyclone tracks. Currently, little is known on the cyclones contribution to the annual dust concentrations transported over the Mediterranean region, as also to the seasonal and spatial dependency of cyclones that induce dust transfer over the basin.

To address the above questions in the frame of BEYOND project, in this study we perform tracking of all intense cyclones for the period 2005-2012 using the ERA-Interim reanalyses, at a resolution of  $0.75^{\circ} \times 0.75^{\circ}$ . Cyclone tracks are then compared and associated with daily satellite estimations of parameters related with dust aerosols, namely the aerosol optical depth, the aerosol index and the aerosol Ångström exponent. Our results showed that cyclones contribute through transport to approximately 10 to 25% of the total number of days with dust over the eastern Mediterranean. However, when we consider cyclones contribution to extreme dust transport events, we show that their contribution rises significantly. Indeed, the cyclones we tracked were shown to be associated with as much as the 30% to 70% of the total number of extreme dust events over the central and eastern Mediterranean.