



## Characterization of cyclones producing intense precipitation events in the Mediterranean region

Marco Reale (1) and Piero Lionello (1,2)

(1) Salento, Material Science, Italy (piero.lionello@unisalento.it), (2) CMCC

This study considers the association between cyclones and winter precipitation events along the Mediterranean coast. Precipitation events are characterized as sequences of wet days with large accumulated total precipitation values. Long sequences with multiple precipitation maxima are split in sets of shorter events. Cyclones are provided by an tracking algorithm applied to the ERA-40 (ECMWF Re-Analysis) dataset for the period 1958-2002. Data for The analysis of daily precipitation are provided by the ECA (European Climate Assessment, hosted at Royal Netherlands.Meteorological Institute, KNMI) dataset. It is found that cyclones producing precipitation vary across the region: different systems are responsible for precipitation in different areas of the Mediterranean region:

- i) In the north-western areas systems are either of Atlantic origin or secondary cyclone associated with the passage of major cyclones north of the Mediterranean basin,
- ii) In the eastern areas cyclones producing intense precipitation are mostly generated inside the basin itself,
- iii) an important fraction of severe precipitation in the southern areas are produced by cyclones that are generated over northern Africa.

Intensity of the circulation (Slp minimum, Laplacian, slp gradient, depth, size) are relevant, but the average speed of the cyclone centre and moisture content of the middle troposphere appear to be the most important characteristics explaining the severity of the precipitation event.