



Cyclones causing winter storms in the Mediterranean region

K. M. Nissen (1), U. Ulbrich (1), G. C. Leckebusch (1), D. Renggli (1), J. G. Pinto (2), and S. Ulbrich (2)

(1) Freie Universität Berlin, Institut für Meteorologie, Berlin, Germany (katrin.nissen@met.fu-berlin.de), (2) Institut für Geophysik und Meteorologie, Universität zu Köln, Germany

Extreme cyclones are of special interest for climate research as they often cause hazardous weather conditions which in turn lead to fatalities, disruption and property damage. In this study we compare the characteristics of extreme cyclones associated with strong wind events over the Mediterranean with non-extreme depressions also affecting this area.

Spatial and temporal persistent areas of adjacent grid boxes in the Mediterranean region with wind speeds exceeding the local 98th percentile are identified and tracked using the 10 m wind field of the ERA40 reanalysis dataset. In order to identify those cyclones associated with the strong wind events, a cyclone identification and tracking scheme has been applied to ERA40 reanalysis MSLP fields and the most probable cyclone based on relative position and intensity is selected as an extreme event. The extended winter season (October-April) for the period 1957 to 2002 is analysed.

The ability of this approach to capture historical events in the Mediterranean region is demonstrated. We find preferred tracks for organized strong wind activity in the Mediterranean, with the most dominant one originating south of the Gulf of Genoa. Another two active regions originate over Greece, with one located in the north west of Greece and the other one east of Crete.

The preferred cyclogenesis regions differ for extreme cyclones affecting the Mediterranean region and non-extreme Mediterranean cyclones: in particular, a higher percentage (41%) of the extreme cyclones is generated over the North Atlantic (NA) while for the non-extreme cyclones only 19% arise from the NA. We find a significant decrease in the number of extreme cyclones during the 45-year ERA40 period over the western and over the eastern part of the Mediterranean basin.