



Extreme northern hemispheric cyclones and their relation to the general circulation in ERA-40

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In the study we investigate the relation between extremes in northern hemispheric mid-latitude cyclone characteristics and the atmospheric circulation. Therefore, ERA40 re-analysis data is used. After applying a state-of-the-art cyclone detection and tracking algorithm the mean gradient of 1000 hPa geopotential height around a cyclone center per 1000 km is used as intensity measure. There is evidence that extremes in midlatitude cyclone intensity are related to the large-scale atmospheric circulation in winter and to a minor degree in spring and autumn. Regionally different circulation patterns are related to extreme intensified cyclones, e.g., cyclones in northern Europe are linked to a NAO-like pattern whereas for southern Europe a blocking-like pattern over northern Europe is observed. In summer these relationships, however, collapse. This gives a hint that in summer other processes, such as convection, play the dominant role. Moreover, the relation to sea surface temperature will be investigated to check a possible pre-conditioning for the occurrence of extremes in midlatitude cyclone intensity.