The IMILAST project : Influence of including open cyclones in storm identification schemes

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In this study we compare two different climatologies of mid-latitude cyclones produced for the IMILAST project, focusing on the effect of different treatment of "closed" and "open" cyclones, that is of cyclones associated or not to minima in the pressure field during all stages of their development. This important technical feature is treated differently in the various algorithms. The first climatology is produced by optimizing the algorithm employed at University of Salento, which is conceived for identifying only closed depressions. The second climatology is produced by the modified Simmonds' algorithm adopted by the Freie Universit‰t Berlin, which is designed for the detection also of open depressions. Data for the analysis of cyclones are provided by ERA-interim 1989-2009, in agreement with the Intercomparison protocol of the IMILAST project. The two algorithms produce different climatologies of track densities, regions of cyclogenesis areas and explosive cyclones (characterised by an unusually large deepening rate of their core pressure at mid-latitudes). For selected extreme events reported in the IMILAST intercomparison protocol a good agreement between the cyclone paths has been found during the central intense part of their life, at the times of high cyclone intensity. while the origin heads and tails of the tracks, when the cyclone was often weak or open, can differ. This is particularly important for the growth rates during the initial stage of the cyclone development and, therefore, for the identification of explosive cyclones.