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Association between cyclones and severe precipitation in the Mediterranean region as reproduced by different tracking algorithms – a contribution to the IMILAST project

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This study considers the Mediterranean storm track and its link with severe precipitation events in the Mediterranean region as reproduced by different tracking algorithms. Data for tracking cyclones are provided by the IMILAST project (http://www.proclim.ch/imilast/index.html). Data for the analysis of precipitation are provided by ECA&D dataset (http://eca.knmi.nl/ hosted at the Netherland Royal meteorological institute). Most of methods identify the "Mediterranean storm track" characterized in all the cases by a prevailing southeastward direction, extending through Italy, down to the Albanian and Greek coasts. They also agree on locating the main cyclogenetic areas in the gulf of Genoa, North-West Africa and Iberia peninsula (in the Western Mediterranean), Cyprus and Black Sea areas (in the Eastern Mediterranean.) However, differences in patterns and in intensity of track features are large and related mainly to: i) how efficiently the schemes identify heat lows generated in summer and spring over Iberian peninsula , North-East Africa and Black Sea; ii) how the schemes locate the cyclogenesis occurring over Northern Italy and Cyprus areas (mainly in winter). A case of severe precipitations over Larnaca (Cyprus) has been analyzed in detail . Most of methods agree to identify a minimum close to Larnaca at the peak of the precipitation event, but differ in the reconstruction of the initial and final portions of the cyclone tracks. The differences observed in the tracks affect important descriptors of the cyclone life cycle, as it is shown by the different estimates of the speed at which cyclones move and their initial deepening rate.