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A climatology of explosive cyclones using a multi tracking approach

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Explosive cyclones are mid-latitude systems characterized by a strong deepening (more than 24hPa over a 24h-period) and are often linked to extreme weather events in both Hemispheres. In this work, we introduce a climatology of explosive cyclones for both Hemispheres based on the IMILAST dataset (Neu et al.,2013). These cyclone track lists have been obtained by applying different cyclone tracking algorithms to the same original dataset (ECMWF Era-interim Reanalysis 1979-2009 1.5) . In each list , explosive cyclones have been selected using a detection criterion based on Normalized central Deepening pressure Rate(NDRC) (Sander and Gyakum, 1980).
Preliminary results show that despite differences among the methods in terms of total numbers of explosive cyclones , there is a substantial consensus on the location, annual cycle, trends and main features of these systems compared to non-explosive cyclones. For example, all the methods agree that explosive systems occur primarily along the Atlantic,Pacific and Mediterranean storm track. In particular, in the Northern Hemisphere there are two distinct maxima close to the eastern North America coastline, and one in the north Pacific close to Japan. In the Southern Hemisphere the maxima is located off the east coast of South America, forming a sort of spiral all around the Antartica peninsula. All the methods agree in showing that explosive cyclones are deeper, faster moving and long lasting with respect the ordinary systems.
A further analysis focusses on the comparison of explosive cyclones features at a regional scale, with a particular emphasis on regional trends and characteristics.

References

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