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A global climatology of explosive cyclones using a multi tracking approach

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Explosive cyclones (EC) are mid-latitude systems characterized by a strong deepening rate (more than 24hPa over a 24h-period) and are often linked to extreme weather events in both hemispheres. Here we introduce a climatology of EC 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 with 1.5 degree of resolution).
Despite differences in the total number of EC detected by the methods, there is a good level of agreement among the methods concerning cyclogenesis and track density of EC as well as their main characteristics, seasonality and trends. EC are shown to be deeper, faster and long lasting with respect to ordinary cyclones in both hemispheres, though EC in the Southern Hemisphere are even more intense than those in Northern Hemisphere. On the other hand, EC in the Northern Hemisphere are characterized by a stronger deepening rate over 6h and 24h.
In the Northern Hemisphere Atlantic EC (in particular in the eastern part of the basin) are, compared to Pacific EC, usually faster, deeper and characterized by higher geostrophically adjusted deepening rate. EC in the western part of both basins are characterized by higher normalized deepening rates with respect to the corresponding EC in the eastern parts. In the Southern Hemisphere, EC south of Africa and Australia are usually faster, deeper and with higher deepening rate with respect to those southeast of south America. Finally, EC close to Southern America and Southern Africa are, in turn, characterized by higher geostrophically adjusted deepening rate, normalized deepening rate and duration with respect to EC formed south of Australia.