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# Tropical Cyclogenesis Conditions in the South-Western Indian Ocean

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Mature tropical cyclones around the world exist through similar atmospheric and oceanic processes: the necessary conditions for these storms to occur (warm SST, atmospheric instability, high humidity in the low to mid-troposphere, low wind shear, enough Coriolis force) are identical over all basins. However, the environments within which pre-existing disturbances evolve into warm-core cyclonic circulations are fairly different in the various basins. This is partly due to the influence of large-scale climatic cycles (e.g. ENSO, AMO, IOD, etc.) and of synoptic-scale propagating modes (e.g. tropical waves, Madden-Julian Oscillation, etc.). While many studies have examined the specific situations of the tropical basins in the northern hemisphere, storm formation is much less known in the southern hemisphere.

Concerning the south-western Indian Ocean (0-30°S, 50-100°E), Bessafi and Wheeler (2006) have shown a large and statistically significant modulation by MJO and convectively coupled Equatorial Rossby waves, and a small yet significant modulation by Kelvin waves. The present study concerns the analysis of cyclogenetic evolution of named storms in the south-western Indian Ocean during 13 seasons from 1999-2000 to 2011-2012, from ECMWF ERA-Interim reanalyses and Meteosat-7 images.

First, the methods used to find tropical storms (also identified in the IBTrACS database) in the ERA-Interim reanalyses will be shown. Besides, the upper- and lower-troposphere conditions in which storms develop will be examined using integrated diagnoses (McTaggart-Cowan et al., 2008).

A spectral analysis in space and time of the different dynamical and thermodynamical environmental parameters (from ERA-Interim reanalyses and Meteosat-7 images) will then be presented. This analysis shows slow (period > 10 days) and fast (period < 10 days) eastward and westward tropical waves. Finally, the relationship between these waves and developing and non-developing storm cases will be discussed.