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Is the Global ENSO or the mesoscale to local IOD signals the dominant driver of (East-)African Precipitation Anomalies and Extremes?

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It is a foregone conclusion that the Global ENSO signal propagates throughout the tropics and is responsible for most of the Inter-annual variabilities and extremes in precipitation. However, this is not always the case as will be shown that it sometimes baffles to predict rainfall from the ENSO-SOI signal. In the (East-)African case, a more local mesoscale precipitation analysis, it is known that the IOD is an equally if not more important source of rainfall variability.

This work determines that localized amplitude and/or phase coherency between the ENSO and the IOD indicies are the dominant sources of Inter-annual variabilities and extremes in African precipitation. We have developed a multi-scale, non-linear method, based on wavelets, multi-fractals and complex network approach from which this assertion is made. We further suggest that this method could be used to check for coherency patterns related to other dipoles around the world.