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cyclogenesis: effects of surface ocean conditions on the birth of tropical depressions off the West African coasts

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About 80% of rainfalls in the Sahel region are generated by MCS (Mesoscale Convective Systems). These systems are often produced in hilly areas (Mountains of Cameroon, Guinea, Nigeria etc.), and follow an east-west trajectory to reach the African coasts. Crossing the coast, some weaken and dissipate while others strengthen to develop into tropical depressions (cyclogenesis). These tropical storms are responsible for much damage on the coasts of west Africa, but also may strengthen into hurricanes that reach American coastlines. The conditions of development or damping of MCS over the ocean are not yet well known. Most of them pass over the littoral of Senegal and the Guineas and then reach the sea, the purpose of this study is to analyze the marine environmental conditions, particularly ocean-atmosphere interactions, involved in the strengthening or dissipation of the convective systems passed these coastlines.
Using the MSG (Meteosat Second Generation) and radar observations, we objectively identified ten cases of strengthening and ten cases of dissipation over the sea near the Senegalese coast. Then we performed a composite analysis to identify the mean structures associated with these case studies. A larger composite analysis was also performed, using Era interim. Observations and the reanalysis show robust SST and relative humidity anomalies associated with the strengthening of MCS, consistent with results by Hopsch et al. (2010). An in-depth study of the composite allows for a discussion of the conditions leading the MCS development, particularly in term of SST and African Easterly waves,
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