The role of east African convection on the initiation of African easterly waves

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Abstract
Most of our knowledge on the association between convection and African Easterly Waves (AEWs) is based on analysis of AEWs in West Africa (e.g., Burpee, 1972; Albignat and Reed, 1980) and the tropical Atlantic (e.g., Thompson et al, 1979). These are regions where the AEWs have peak amplitudes and are most coherent. We still know very little about the nature of AEWs and their relationship with convection in the region east of 10°E. This is most likely due to a combination of factors including data sparsity there but also because AEW structures are in the early stages of development. Indeed, there is still no consensus regarding the source region of AEWs and the mechanisms for their genesis. Albignat and Reed (1980) concluded that the source region of AEWs was west of 10°E. Carlson (1969b) found that nearly one-half of the waves he identified had their origin east of 18°E and suggested that the possible generating mechanism for wave disturbances may involve the interaction between convective processes and highlands over Sudan and Ethiopia. Recently, Berry and Thorncroft (2005) hypothesized that AEWs form when the unstable basic state is perturbed by convection over the Darfur mountains (western Sudan). They argued that AEWs form as a dynamic response to large convective outburst consisting of several MCSs leading to downstream development along African easterly jet (AEJ) from which hurricane Alberto in August 2000 later owes its existence. The idea that AEWs are forced by finite amplitude convective precursors is also consistent with a recent numerical modeling results by Hall et al. (2005) and Thorncroft et al (2005) who suggested that the AEJ is stable to small perturbations. Most of the past observational studies were based on short time periods or individual cases. More analysis using time periods longer than a season or few seasons is clearly required to shed light on the eastern extent of AEW activity and its relationship with con-
vection, including how this varies from year-to-year. The purpose of this study is to highlight the role of eastern African regions on the initiation of AEWs through examining the association between synoptic timescale variability in convection and AEWs.

Presentation will focus on the year-to-year variability of the propagating convective systems from the source regions in east Africa and assess the extent to which these regions are important for initiating AEW development downstream. Westward/eastward propagating structures based on time-longitude Hovmollers of the 2-6day filtered brightness temperature will be identified. Brightness temperature and ECMWF 40-years reanalyses data sets will be employed.