

## **Abstract**

Spectral analysis using high resolution brightness temperature ( $T_B$ ) data shows significant power in the 2–6-day range over tropical West and central-eastern Africa and eastern Atlantic. Within the regions of tropical deep convection, the 2-6day time scale variance accounts for about 25%–35% of the total variance.

The 2–6-day convective variance has similar amplitudes over western and eastern Africa, while dynamic measures of AEW activity show stronger amplitudes in the west. Weak AEW activity in the east is consistent with initial wave development there. AEWs are initiated by the convection triggered on the western sides of the Darfur Mountains (western Sudan) and Ethiopia. The subsequent development and growth of AEWs is associated with stronger coherence with convection there.

Composite analysis based on regression shows Kelvin wave propagation between the Pacific and tropical Africa. This wave propagates faster at the primary source regions over the Pacific and western Atlantic, and slows down over tropical Africa, suggesting strong coupling between dynamics and convection.

Analysis of weather events during July-September 1987 has shown that daily rainfall increases when enhanced Kelvin wave approaches regions, while it sharply fell when the wave passed by. This weather event also shows a series of African easterly waves (AEWs) being initiated or enhanced in association with the enhanced Kelvin wave.

Anomalously high Kelvin wave activity is associated with dry years over Africa, while anomalously low Kelvin years tend to occur during wet years. Also, anomalously high Kelvin wave variability is related to anomalously high sea surface temperature (SST) anomalies over equatorial eastern Pacific, indicating the importance of warm episodic years on Kelvin wave development. The same SSTs which favor increased Kelvin wave activity are negatively related to African rainfall.

It is suggested that spectral peak in 2-6-days time scale found over eastern Africa is associated with upper tropospheric easterly waves that originate over Southeast Asia and propagate through Africa during the boreal summer. Also, the spectral peak over East Africa may also be associated with the recharge-discharge convective process between equatorial and tropical eastern Africa. This work is in progress.