

ATS/CIRA Colloquium

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Visiting ATS from NOAA

**Influence of the Basic State Zonal Flow on Convectively
Coupled Equatorial Waves**

Hosted by Wayne Schubert and Thomas Birner

Friday, December 12, 2014

**ATS room 101; Discussion will begin at 11:15am
Refreshments will be served at 10:45am in the weather lab**

Convectively coupled equatorial waves (CCEWs) represent the leading modes of synoptic scale organized convection in the tropical troposphere and they are known to affect weather in both the tropics and midlatitudes. Despite their prominence in the observations, CCEWs are poorly represented in current general circulation models used to predict weather and climate. Because of their implied level of deterministic predictability, it is important to understand the key physical mechanisms underlying their variability in order to improve their model representation. In this talk, the impacts of the basic flow on CCEWs will be discussed. Localized space-time spectra are calculated to investigate how equatorial wave activity varies across the tropics, and how they are affected by the substantial variations in zonal flow observed geographically and by season. Doppler shifting by the basic state barotropic zonal flow is readily identified. Once this Doppler shifting is taken into account, the scales (as measured by the so called "equivalent depth") of CCEWs inferred from global power-spectra are surprisingly uniform, both geographically and temporally. However, there are also detectable modulations that appear consistent with changes in vertical shear of the zonal flow, along with other shifts that are not as easily explained.

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>