

ATS/CIRA Colloquium

Kerry Emanuel

Visiting ATS from MIT

**Radiative-Convective Equilibrium and its Instability:
Implications for Weather and Climate**

Hosted by Sue van den Heever

Friday, November 7, 2014

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

The concept of radiative-convective equilibrium (RCE) is the simplest and arguably the most elegant model of a climate system, regarding it as a statistically one-dimensional balance between radiative and convective heat transfer. In spite of this, RCE is seldom studied and poorly understood today. Recent advances in cloud-system-resolving numerical models have made it possible to explicitly simulate such states, simulating the convective plumes themselves rather than representing them parametrically. The simulations reveal a startling phenomenon: Above a critical surface temperature, moist convection spontaneously aggregates into a single cluster, in a non-rotating system, or into multiple tropical cyclones on a rotating planet. I will discuss the physics of this important phase transition and what it might imply about weather and climate.

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