

ATS/CIRA Colloquium

Mark DeMaria

CSU ATS M.S. 1979 and Ph.D. 1983

Technology and Science Branch Chief of the NOAA/NWS National Hurricane Center

Generalizing Tropical Cyclone Potential Intensity Estimates to Include Vertical Shear Effects

Friday, January 24, 2014

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

Empirical and theoretical methods have been used to estimate the upper bound on tropical cyclone maximum winds, which is often referred to as Potential Intensity (PI). Perhaps the most well known PI formulation is the one developed by Kerry Emanuel, which provides an upper bound intensity estimate using a Carnot heat engine framework. That theory results in an equation for PI as a function of the sea surface temperature and outflow temperature. Observational studies indicate that tropical cyclone intensities almost never exceed the value from Emanuel's PI formula, but most tropical cyclones do not come close to reaching this upper bound at any time during their life cycle. The most common explanations for cyclones that do not reach their PI are ocean feed back and atmospheric vertical shear in the storm environment. This talk will describe a method to modify Emanuel's PI intensity formulation to include the effects of ocean interaction and vertical shear to provide a more accurate estimate of the upper bound on tropical cyclone intensity.

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