Title: Isentropic analysis of hurricanes.

Hurricanes, as many other atmospheric flows, are associated with turbulent motions over a wide range of scales. Here we propose to adapted new technique based on the isentropic analysis of convective motions to study the circulation in hurricanes simulations. The proposed approach separates the vertical mass transport in terms of the equivalent potential temperature of the air parcels. In doing so, one separates the rising air parcels at high entropy from the subsiding air at low entropy. This also filters out oscillatory motions associated with gravity waves and isolate the overturning motions associated with convection and the meso-scale circulation.

Here, we analyze a highly idealized hurricane simulations from the the Weather Research and Forecasting (WRF 2.2) model on the 1000km by 1000km domain at 1km horizontal resolution. To average the calculated parameters we choose 12 hours of the most steady, axisymmetric circulation. We determine the characteristics of this steady state to compare it with the transient features. The approach is well-suited for analysis of simulated convection without requiring specifics of the models. This is advantageous in diagnostics of the convective transport in increasingly complex numerical models. The isentropic streamfunction could be used as an intermediary diagnostic for comparison between high resolution cloud resolving models and single column models.