Microphysical Observations in Hurricane Earl

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Observations from Earl, 2 Sept

a: Temperature

b: Small Particle Concentration
Temperatures in Earl Eyewall, 2 Sept.

a: DADS

b: MMS
This image represents one minute of flight time.
Saharan Air Layer Tracking Product
Meteosat-9/GOES-11

September 2, 2010 – 12:00:00 UTC
NOAA Back Trajectories

NOAA HYPLIT MODEL
Backward trajectories ending at 0000 UTC 03 Sep 10
GDAS Meteorological Data

Source ◆ at 30.90° N 74.80° W

Meters AGL

This is not a NOAA product. It was produced by a web user.
Job ID: 332512                Job Start: Wed Jun 1 17:06:31 UTC 2011
Source 1 lat: 30.9° lon: -74.8° hghts: 2000, 4000, 6000 m AGL
Trajectory Direction: Backward  Duration: 72 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 01 Sep 2010 - GDAS1
Summary and Conclusions

- Highly supercooled liquid water observed in Hurricane Earl
- High concentrations of small cloud droplets
  - First direct observation of activation of dust aerosols to cloud droplets in a hurricane
  - Small cloud droplets are resistant to collection by drops and freezing to ice
- Droplets likely activated aloft rather than near cloud base
- Delayed latent heating from droplet freezing to ice likely did not play a major role in dynamics
- Radiative properties of high concentrations of small ice likely significant
- What influence did the eyewall replacement have on the production and transport of drops in the updrafts?