Observations Of C-Band Brightness Temperature And Ocean Surface Wind Speed And Rain Rate In Hurricanes Earl And Karl (2010)

HIRAD Physical Principles

Ocean surface emission is affected by:
- Sea surface temperature
- Wind speed (foam fraction)
- Salinity

After production of calibrated Tb fields, geophysical fields wind speed and rain rate (or column) are retrieved

Earl Flight 1-2 Sept 2010

Earl and Karl Flights

In the figure to the right, HIRAD 5 GHz excess Tb (left) and P-3 lower fuselage radar reflectivity at flight level are shown for two times. The green “diamond” indicates approximate position of the WB-57 at the time of P-3 storm center crossing in the corresponding figure to the right. Key features may be seen in both observations:
1) Peak eyewall Z centered left of track and open eyewall right of track due to easterly environmental shear.
2) Outer eyewall concentric rainband, which together with the eyewall contracts slightly between the two composites.
3) Evolving outer rainband structure.

HIRAD Technology Investment Roadmap

Karl 16 Sept 2010