

Warm Core Structure of Hurricane Erin

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Objectives:

- 1. Map the 3D thermal core of Erin in relation to the rainfall structure and vortex winds**
- 2. Relate (hydrostatically) the column-measured warming to the observed surface pressure fall**
- 3. Understand how environmental shear interacts with and hastens the weakening of Erin (September 10 and thereafter)**
- 4. Compare in situ warm core measurements with co-incident AMSU overpass**

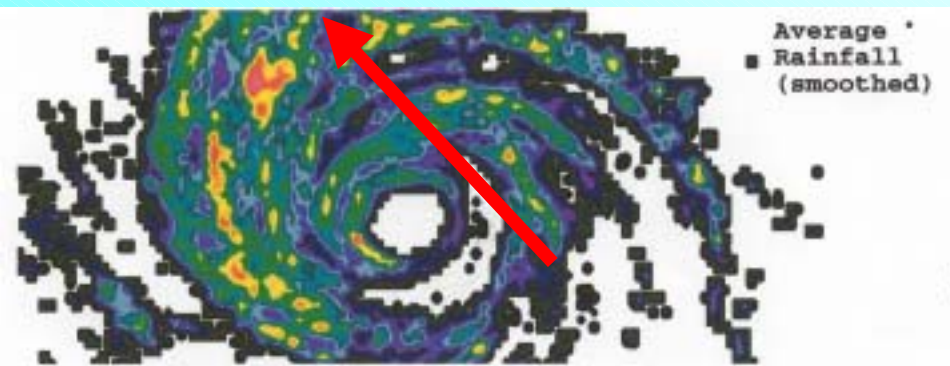
Datasets:

- 1. ER-2: Dropsondes, EDOP, MTP**
- 2. DC-8: Dropsondes**
- 3. Satellite: GOES, TRMM, QuickSCAT**

- Hurricane Erin (Category 3 00Z September 10) weakened 25 kts during CAMEX-4 sortie
- Weakening heralded by increasing southerly component of tropospheric (200-850 mb) shear
- Marked wavenumber 1 asymmetry in the rainfall persisted during the day on September 10
- Rainfall maximum was generally located “downshear left”

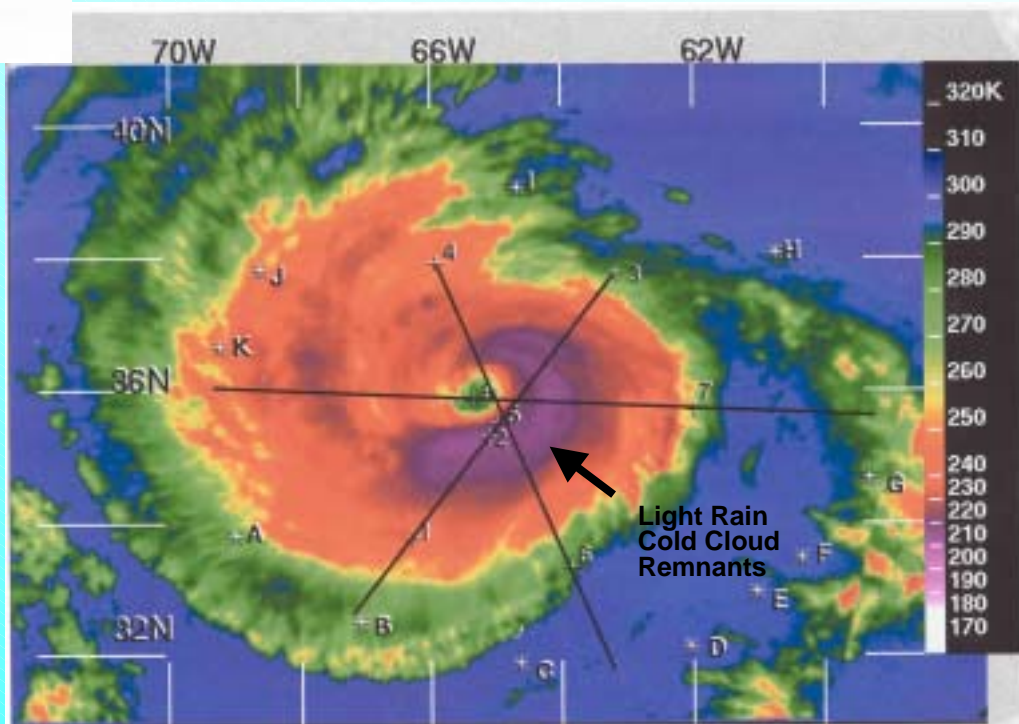
TRMM PR Derived Rainfall - Sept 10 1230 Z

NOGAPS 12Z Shear: 143° 2.5 m/s



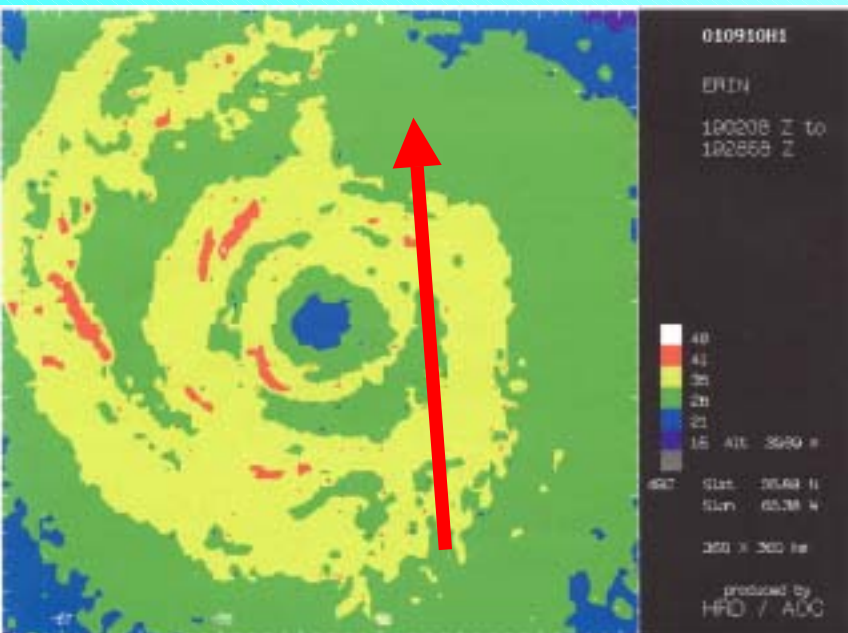
GOES IR Cloud Top Temperatures 1932 Z

ER-2 Transects & Dropsonde Locations



NOAA P3 Derived Rainfall - Sept 10 1915 Z

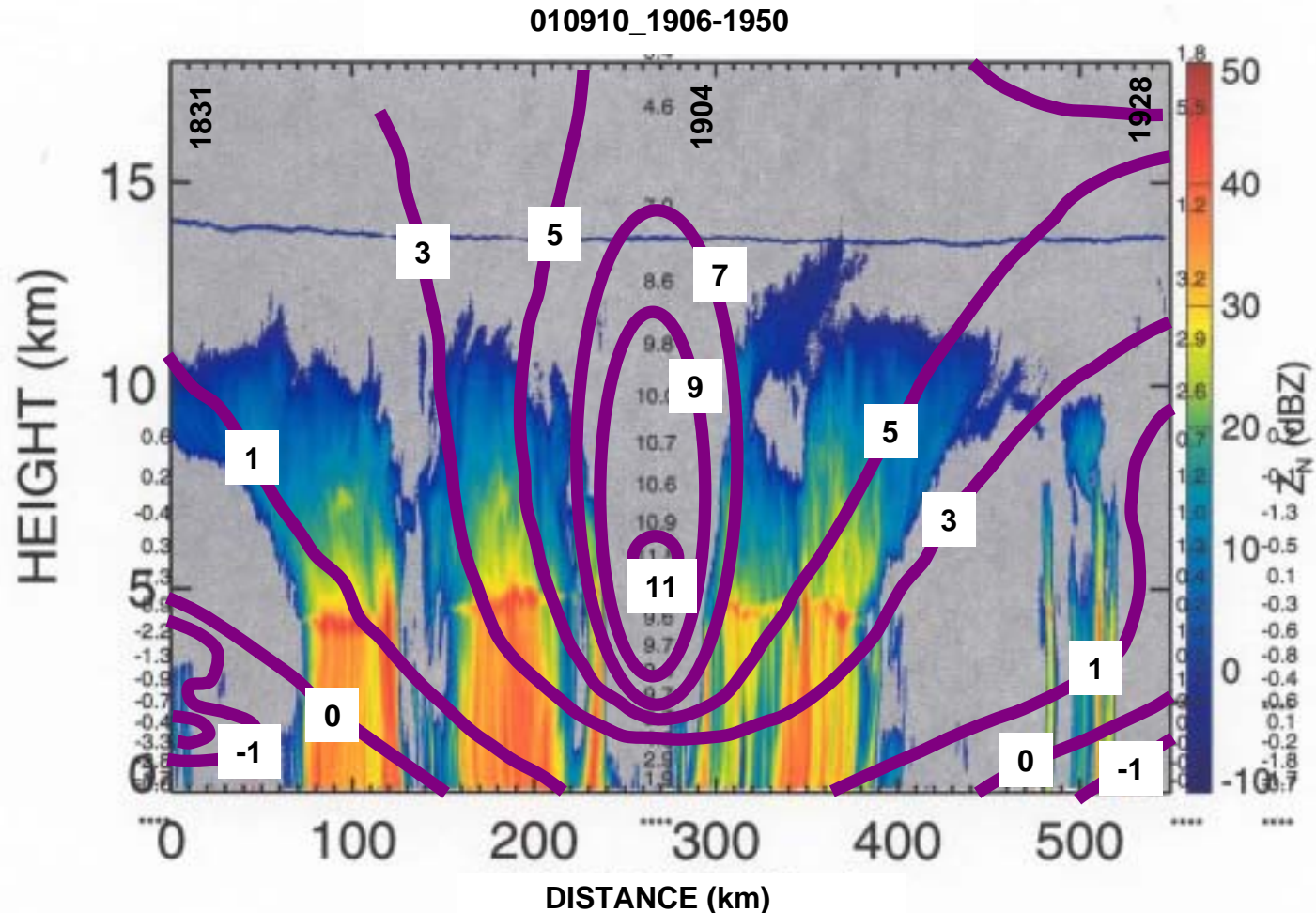
NOGAPS 12Z Shear: 174° 4.5 m/s



GOES IR Image of hurricane Erin at 1932 UTC. Positions of NASA DC8 (+) ER2 (+) dropsondes have been overlaid.

EAST TO WEST CROSS SECTION

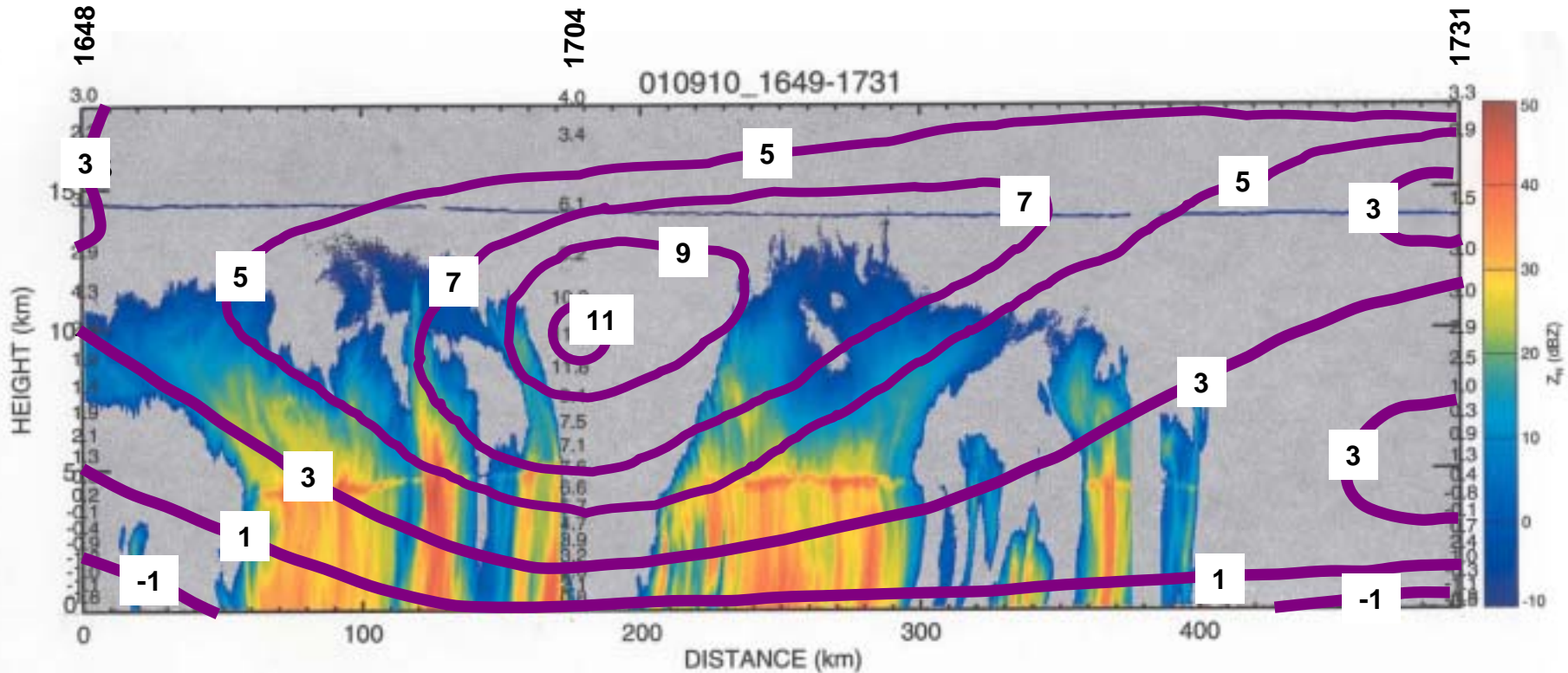
ER-2 EDOP PLUS DROPSONDE-DERIVED TEMPERATURE ANOMALIES



- Eyewall vertically erect
- Warm core erect and very deep (+10 K perturbation 5 to 10 km)

SOUTHWEST TO NORTHEAST CROSS SECTION

ER-2 EDOP PLUS DROPSONDE-DERIVED TEMPERATURE ANOMALIES



- Eyewall vertically erect on SW side, tilted on NE side
- Warm anomaly not as vertically contiguous
- Warm anomaly deformed to NE by shear > warm plume tilted in same sense as sloping eyewall