

2019 NOAA/AOML/HRD Hurricane Field Program - IFEX

EARLY STAGE EXPERIMENT *Science Goals & Observational Applications*

Tail Doppler Radar (TDR) Experiment: Paul Reasor (Co-PI), John Gamache (Co-PI)

Goal: The goal of the Early Stage TDR Experiment is to provide real-time quality-controlled airborne Doppler-radar radial velocities, as well as Doppler wind fields in the form of three-dimensional Cartesian analyses, and vertical cross-sections of analyzed wind along the inbound and outbound radial flight tracks, to EMC, NHC, and CPHC. This is not a basic science experiment, even though the results can contribute to such studies, particularly composite early-tropical-cyclone composites and statistical studies. A new goal is determining whether the three-dimensional analyses can provide better information for assimilation than the more raw Doppler radial velocities. Another goal is to begin to test assimilation of TDR radar reflectivity [*IFEX Goals 1, 2*]. See the 2019 HRD HFP web page for additional details:

<http://www.aoml.noaa.gov/hrd/HFP2019/index.html>

Observational Applications: the added value of TDR observation over flight-level data, dropsondes and satellite data continue to be a topic of research. It is expected there is more value in early-stage tropical cyclones than in deep, well-organized systems, particularly in describing the tilt of the center, and the generally greater effect of shear over the system. The HRD HEDAS group is also beginning to evaluate whether including reflectivity and rms-error estimates of both velocity and reflectivity in the superobs can help the assimilation process. The HRD assimilation group will also be evaluating the products from this experiment to compare model runs using radar-radial observations with those using three-dimensional wind and reflectivity analyses.