2019 NOAA/AOML/HRD Hurricane Field Program - IFEX

EARLY STAGE EXPERIMENT
Science Goals & Observational Applications

Analysis of Intensity Change Processes Experiment (AIPEX): Robert Rogers (Co-PI), Jon Zawislak (Co-PI), Trey Alvey (Co-PI), Jason Dunion (Co-PI), Ghassan Alaka (Co-PI), Heather Holbach (Co-PI), Xiaomin Chen (Co-PI), Josh Wadler (Co-PI, UM/RSMAS)

Goal: The goal of this experiment is to collect aircraft observations (i.e., tail Doppler radar, lower fuselage radar, dropsonde, flight-level data, Doppler Wind Lidar, and stepped-frequency microwave radiometer) that will allow us to characterize the precipitation and vortex-scale kinematic and thermodynamic structures of tropical cyclones (TCs) experiencing moderate vertical shear. Understanding the reasons behind these structures, particularly greater azimuthal coverage of precipitation and vortex alignment, will contribute toward a greater understanding of the physical processes that govern whether TCs will intensify in this type of environment [*IFEX Goal 3*]. See the 2019 HRD HFP web page for additional details:
http://www.aoml.noaa.gov/hrd/HFP2019/index.html

Observational Applications: The data collected during this experiment will be useful for the evaluation of numerical model performance in the challenging forecasting environment of moderate vertical wind shear [*IFEX Goal 1*]. Radar measurements of reflectivity and vertical velocity, along with flight-level measurements of vertical velocity, can be used for the evaluation of microphysical parameterizations. Dropsonde measurements of low-level kinematic and thermodynamic structures and SFMR measurements of surface wind speed can be used to evaluate the performance of planetary boundary layer parameterizations. Select datasets can be withheld in observing system experiments (OSEs) to assess the impact of them on modeling accurately the TC structure and evolution. Finally, deep tropospheric dropsonde data can be used to assess the ability of geophysical retrievals (e.g., relative humidity) from operational satellites (e.g., instruments on NOAA-20, S-NPP) to accurately represent the characteristics of the environments moderately-sheared storms interact with.