

# 2019 NOAA/AOML/HRD Hurricane Field Program - IFEX

## MATURE STAGE EXPERIMENT *Flight Pattern Descriptions*

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**Experiment/Module:** Gravity Wave Module

**Investigator(s):** Jun Zhang (Co-PI), David Nolan (Co-PI, University of Miami))

**Requirements:** Categories 2–5

**Mature Stage Science Objective(s) Addressed:**

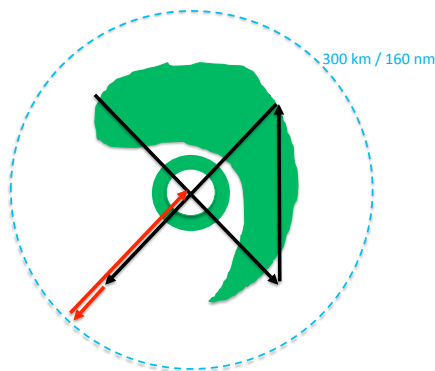
- 1) Collect observations targeted at better understanding internal processes contributing to mature hurricane structure and intensity change. These processes include mixing between the eye and eyewall, secondary eyewall formation, the TC diurnal cycle, and gravity waves that emanate from the TC inner core [*IFEX Goals 1, 3*]

**P-3 Module 1:**

**What to Target:** Sample the inner core and near environments of the TC

**When to Target:** Any strength TC; no land restrictions. This module ideally should be conducted in quadrant with the least rainband activity, typically the upshear right or right-real quadrant. The best opportunity is at the end of a standard Figure-4 pattern, when the last leg terminates in a quadrant with less rainbands

**Pattern:** Any standard P-3 pattern that provides symmetric coverage (e.g. Rotated Figure-4, Figure-4 Butterfly, etc.). At the end of the last leg, continue outward to distance of 160 n mi (300 km) from the center, or further if possible (see Fig. MA-1). Then turn the P-3 around and head directly back to the eye, retracing the previous leg in the opposite direction.



**Figure MA-1.** Depiction of the Gravity Wave module in which the P-3 flies an extended leg (160 n mi) (red path) and reverses course along the same azimuth back to the eye.

**Flight altitude:** 10–12 kft or as high as possible

**Leg length or radii:** Leg lengths should extend to at least 160 n mi (300 km) from the center, or further if time permits, including the turn leg back the center

**Estimated in-pattern flight duration:** ~40 min – 1 hr

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**Expendable distribution:** Dropsonde and AXBTs are not a requirement

**Instrumentation Notes:** Use TDR defaults. Use straight flight legs as safety permits.