Feedbacks on TC intensity (i.e. surface enthalpy fluxes/differential longwave cooling) also increase spatial variance of MSE.

Can we capture this variance w/ sparse observations? If so, we can quantify these feedbacks to analyze TCs w/ dropsondes!

System for Atmospheric Modeling (SAM\textsuperscript{1}) Simulations

- Choose various patterns of grid points to represent dropsondes
- How good are our calculations of MSE variance and feedbacks compared to using the full domain/TC-centered box?
- Typical upper-air patterns miss inner-core extrema.
- But they capture MSE variance and relevant feedbacks fairly well.

An encouraging outlook to begin testing w/ observations!

Dropsonde Observations: Teddy and Sally

- Teddy flight has 3 legs: Transect, Star, Arc. Samples outer environment well, but not core.
- Sally flights sample inner core well, but little outside 400 km from center.
- Teddy: Mid-level minimum in MSE at far radii due to envelope of dry air.
- Combined: Approximately linear decrease in column-integrated MSE w/ distance.

Need widest radial coverage possible!

But potential exists for this perspective to aid in real-time intensity forecasts.