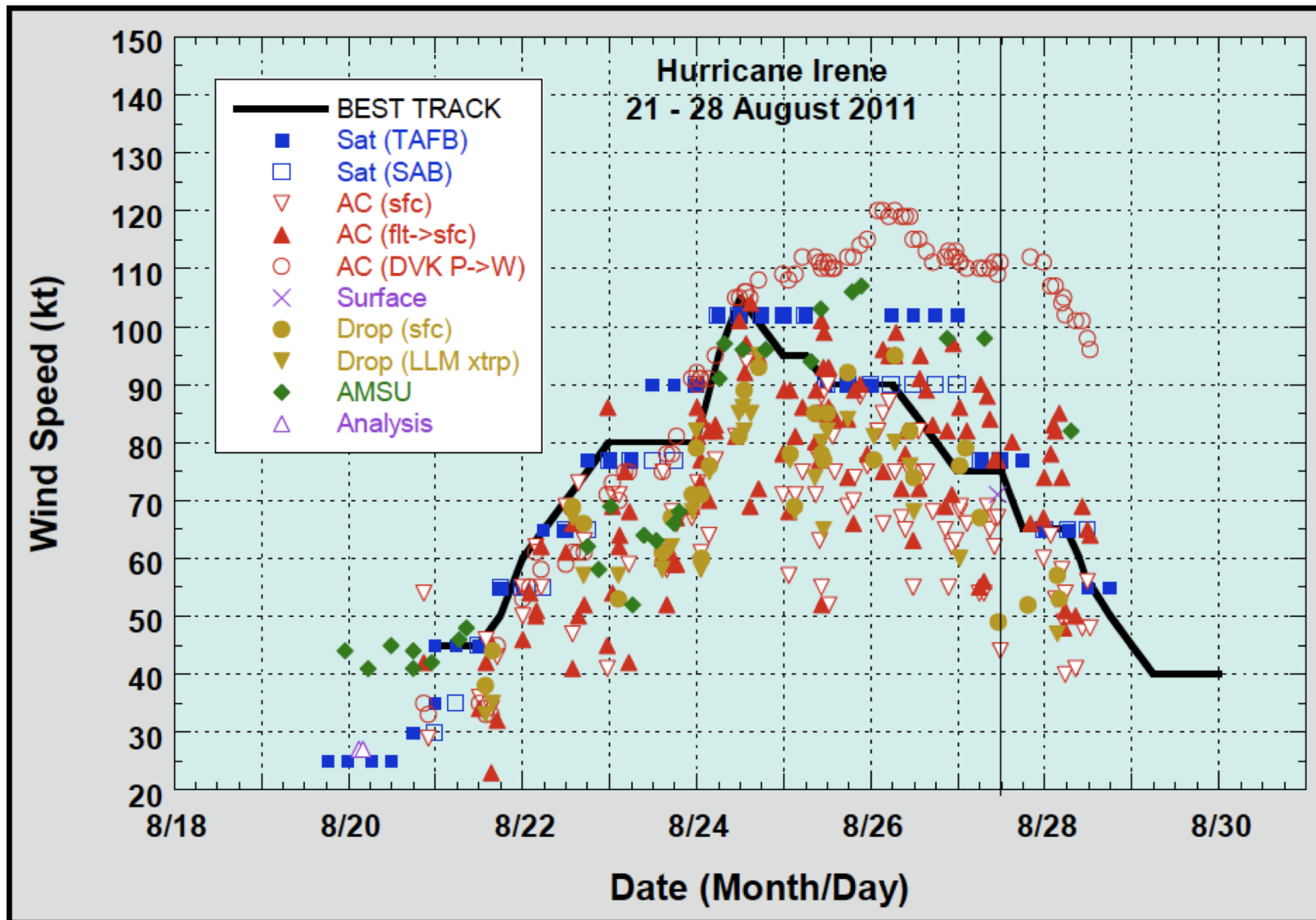
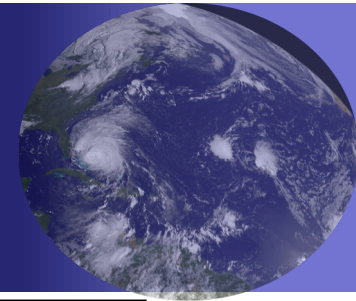


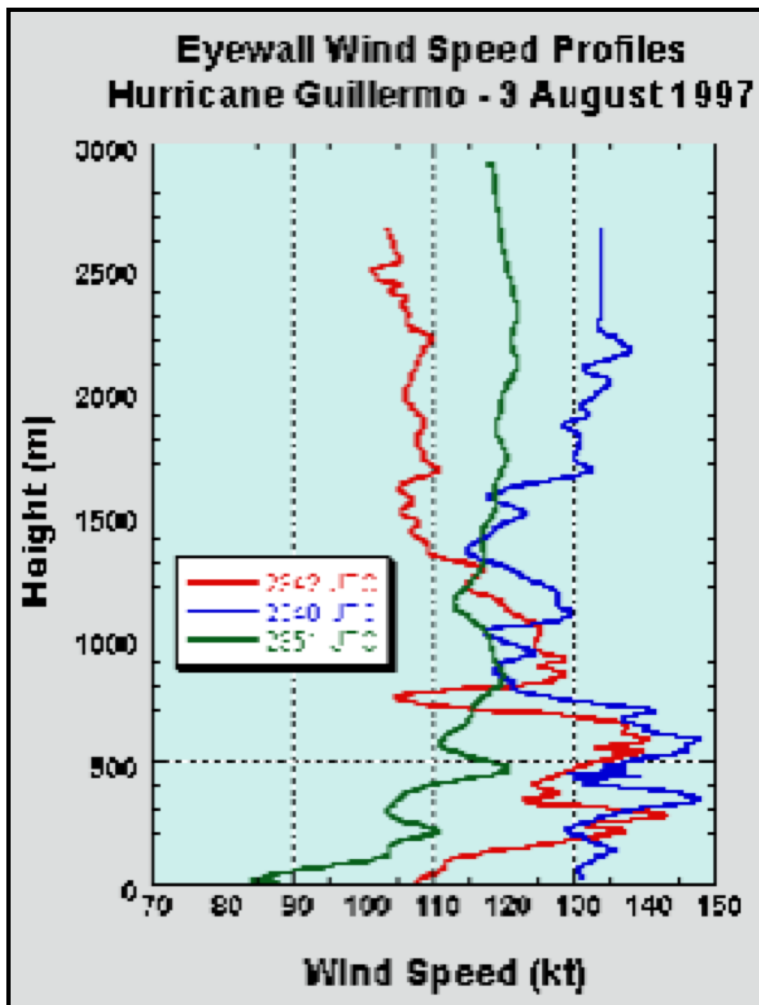
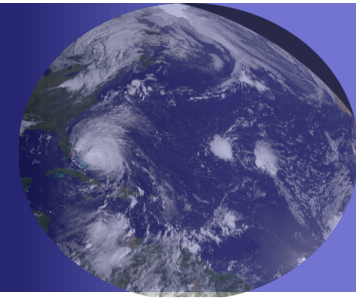
Observation Reality



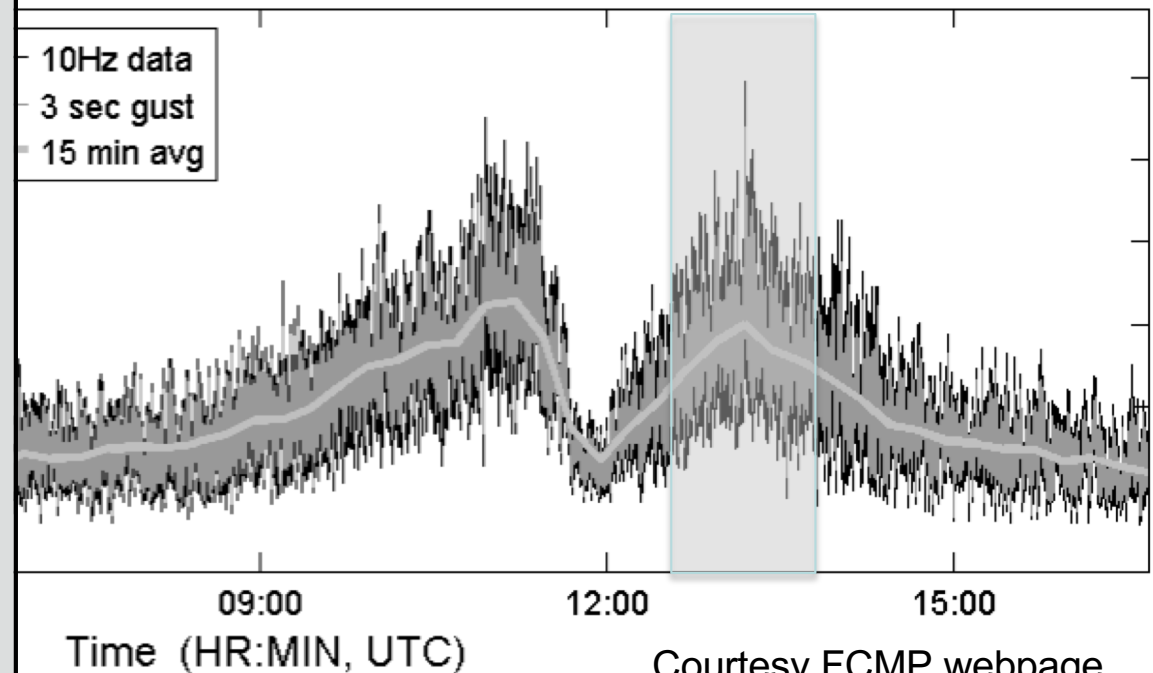
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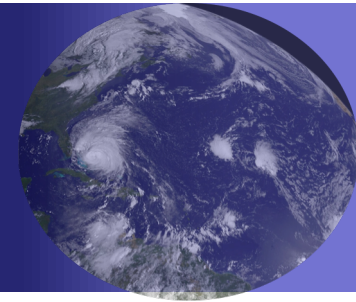
Observation Reality



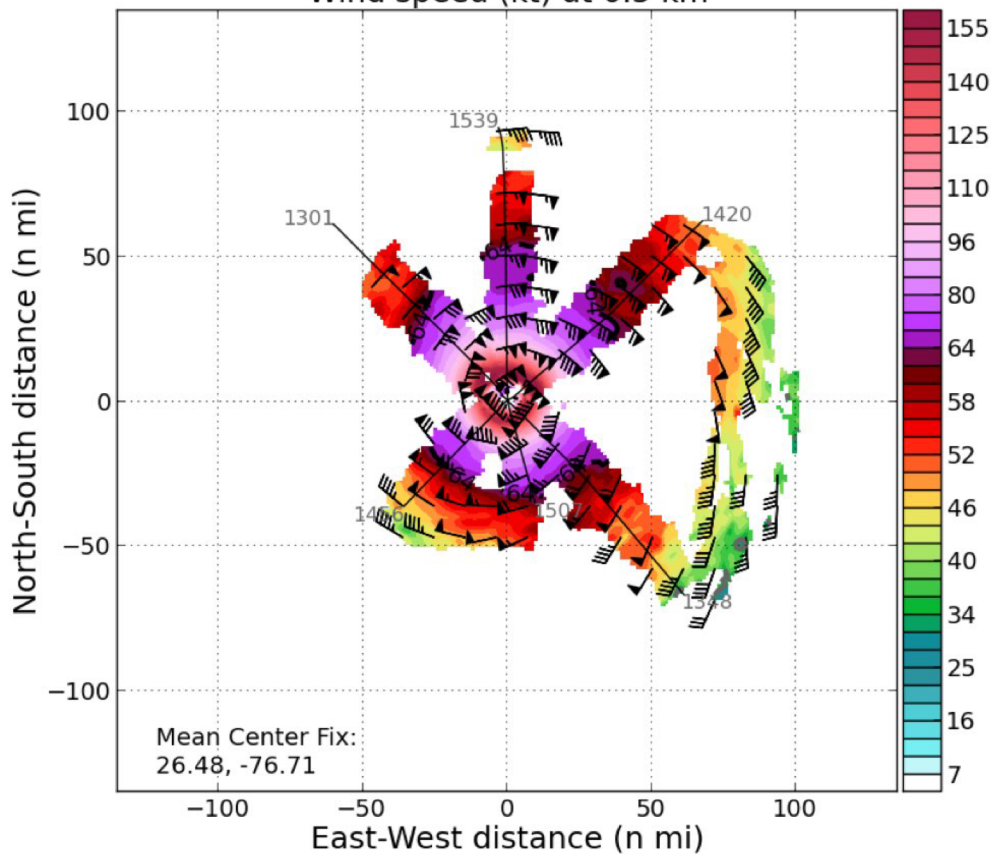
CHOPPI, FL)-10M GILL ANEMOMETERS



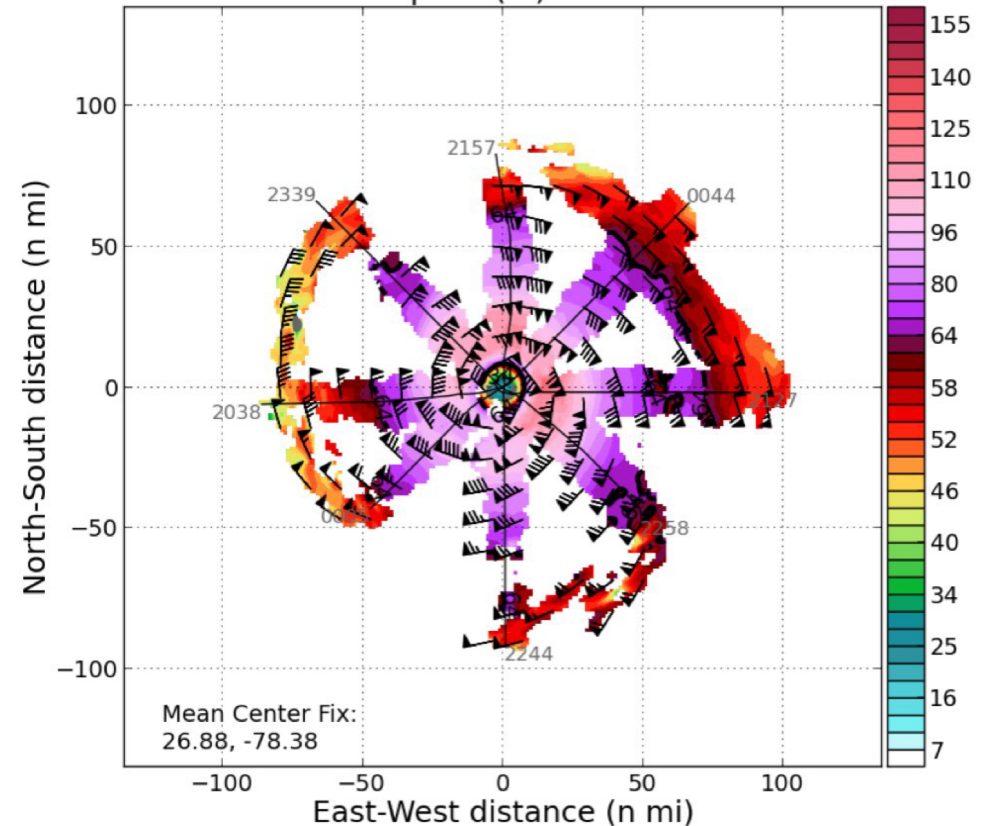
Observation Reality



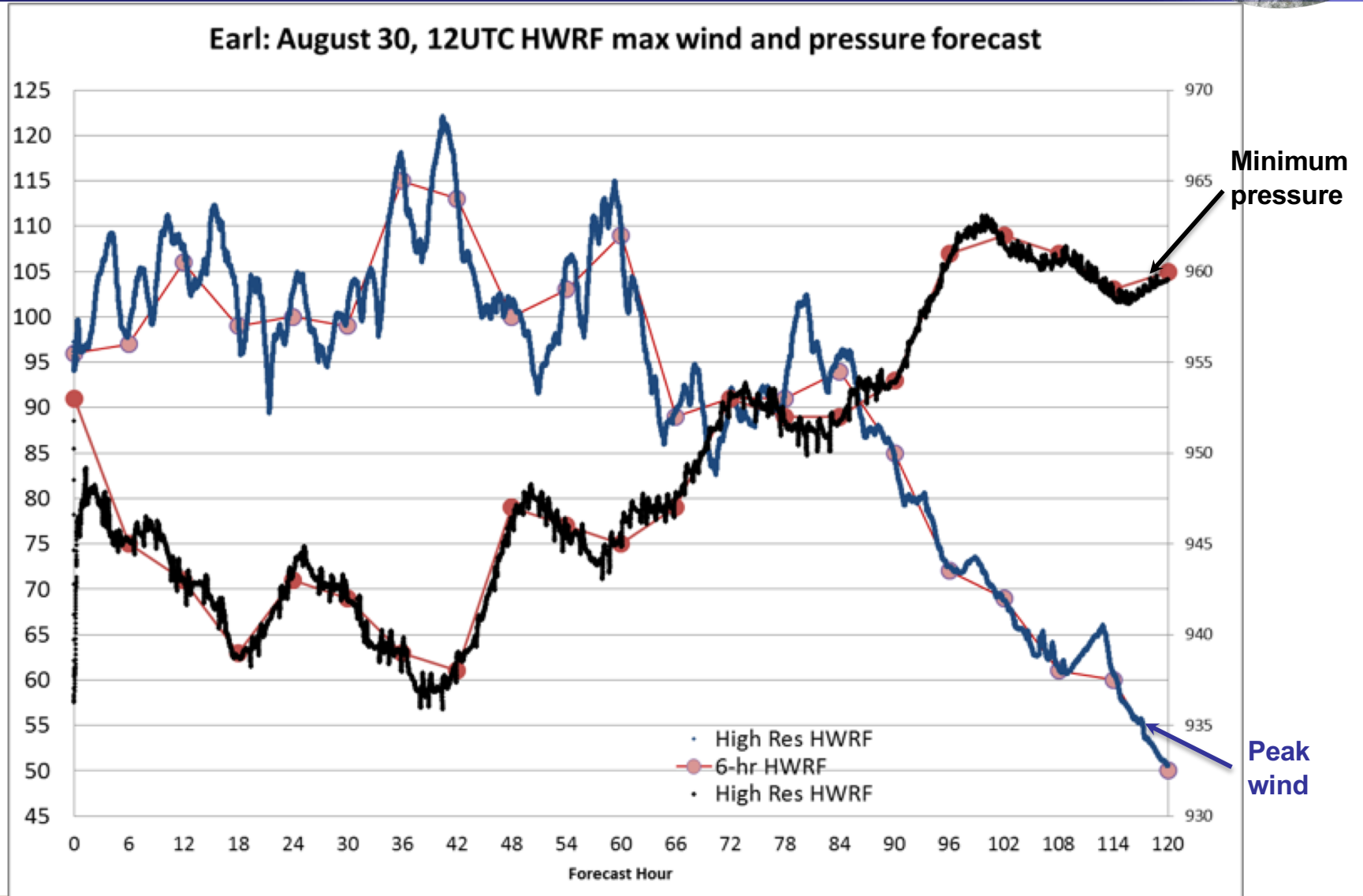
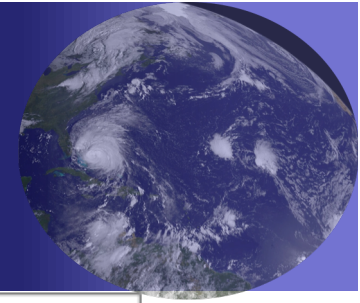
190901H1 (DORIAN)
130132 to 153947 UTC
Wind speed (kt) at 0.5 km



190902H2 (DORIAN)
203800 to 244445 UTC
Wind speed (kt) at 0.5 km



Model Reality



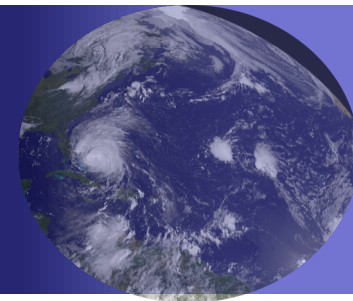
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Courtesy D. Zelinsky (NHC)



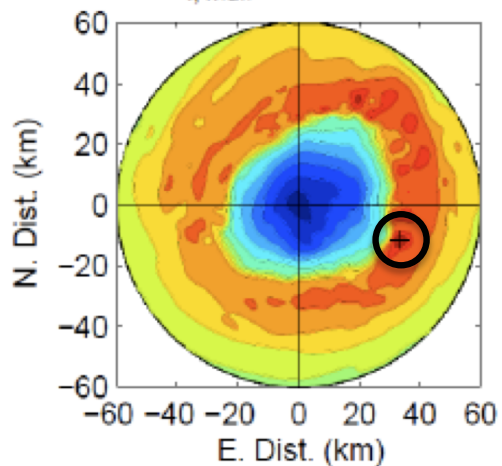
Model Reality



T1

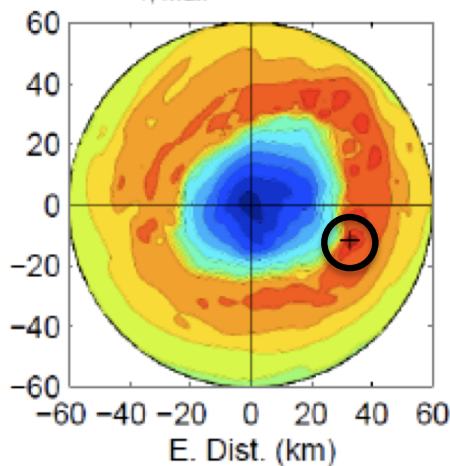
Instantaneous Vmax

$$V_{i, max} = 69.5 \text{ m s}^{-1}$$



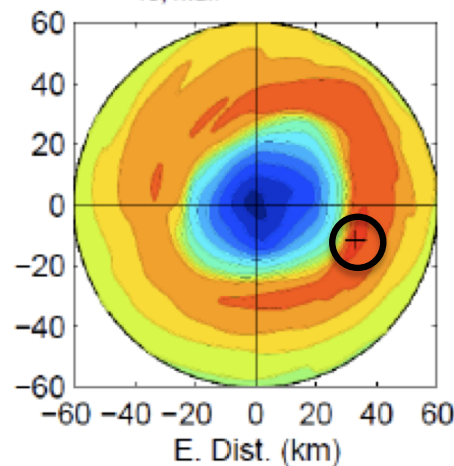
1-min Vmax

$$V_{1, max} = 68.3 \text{ m s}^{-1}$$



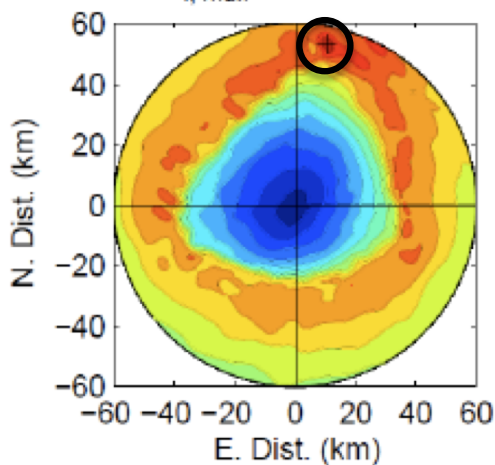
10-min Vmax

$$V_{10, max} = 62.2 \text{ m s}^{-1}$$

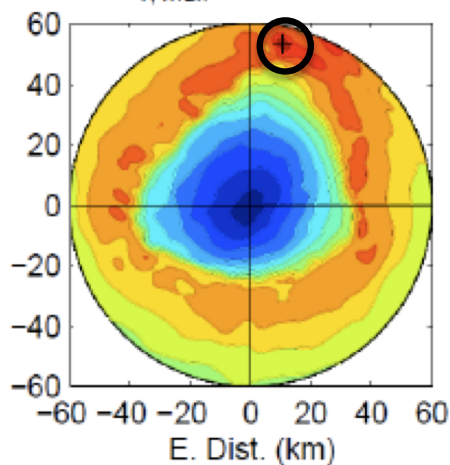


T2

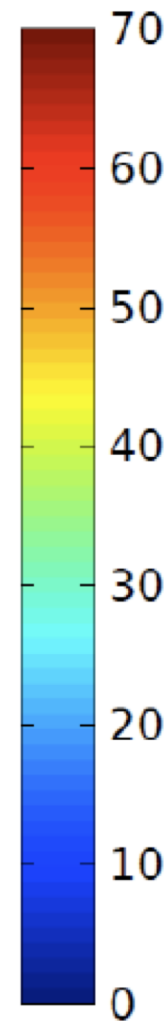
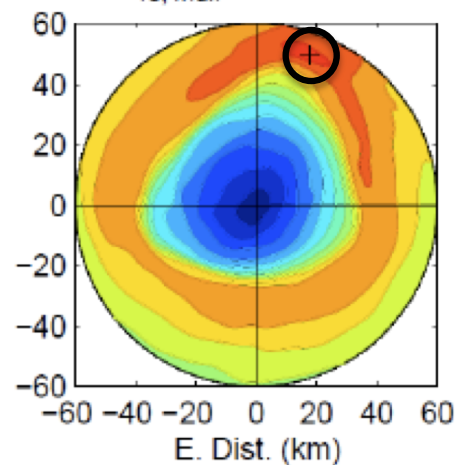
$$V_{i, max} = 69.6 \text{ m s}^{-1}$$



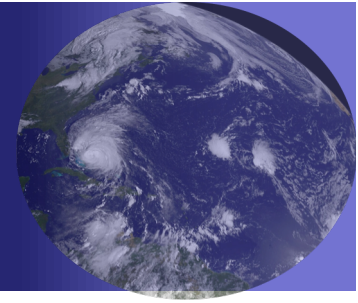
$$V_{1, max} = 68.1 \text{ m s}^{-1}$$



$$V_{10, max} = 62.0 \text{ m s}^{-1}$$



Simple Model



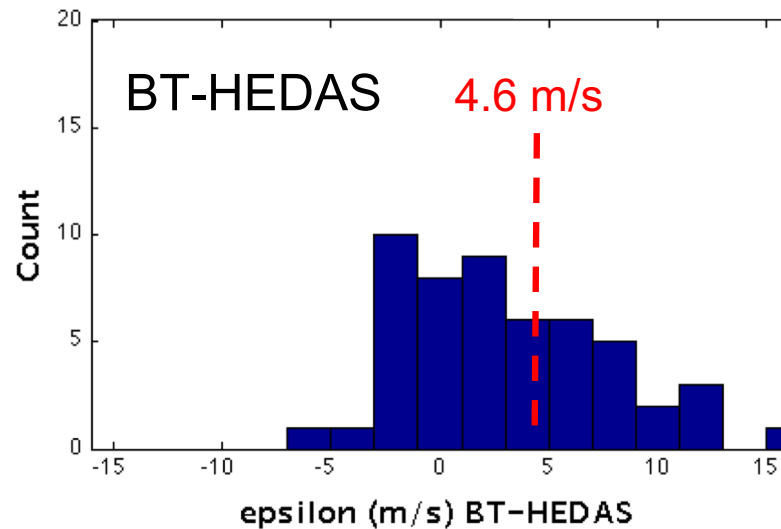
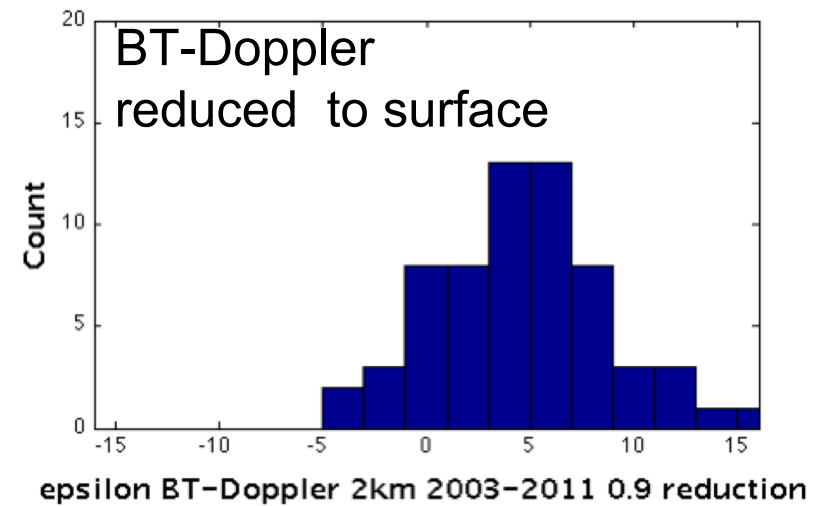
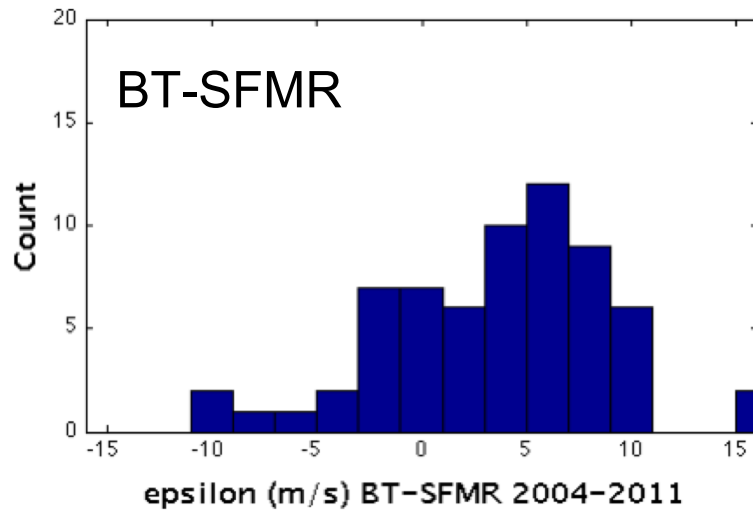
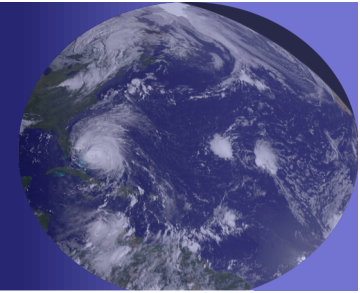
- In storm centered coordinates $V_{\max}(r, z)$ is defined

$$V_{\max} [V(\theta, rmw, 10m)] = V_0(r, z) + V_1(r, z) + \varepsilon$$

$$\varepsilon = V_{\max}(10m) - \alpha[V_0(rmw, z) + V_1(rmw, z)]$$

- ε is a stochastic quantity with variance within observation uncertainty

Uncertainty (ϵ)



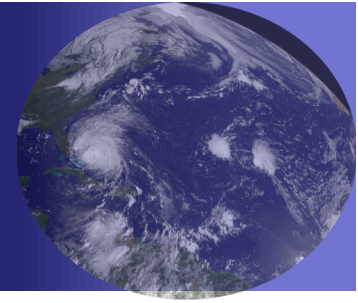
Courtesy P. Reasor, E. Uhlhorn and B.Klotz

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Conclusions



- PDFs suggest \mathcal{E} is stochastic and V_{\max} can be treated statistically consisting of low-wavenumber plus residual
- Residual standard deviation $< V_{\max}$ observation error
- Residual can be interpreted as maximum V_{\max} error
 - PDF shows V_{\max} is represented in analyses, and is accurate to within observation error of $\sim 4.6 \text{ m s}^{-1}$
- Results suggest that **if** low-wavenumber amplitudes and RMW are predictable, V_{\max} should be predictable within observation uncertainty
- \mathcal{E} is likely predictability limit for 1-min sustained wind