Understanding Hurricane Sandy's Track and Intensity Changes

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NOAA/AOML Hurricane Research Division
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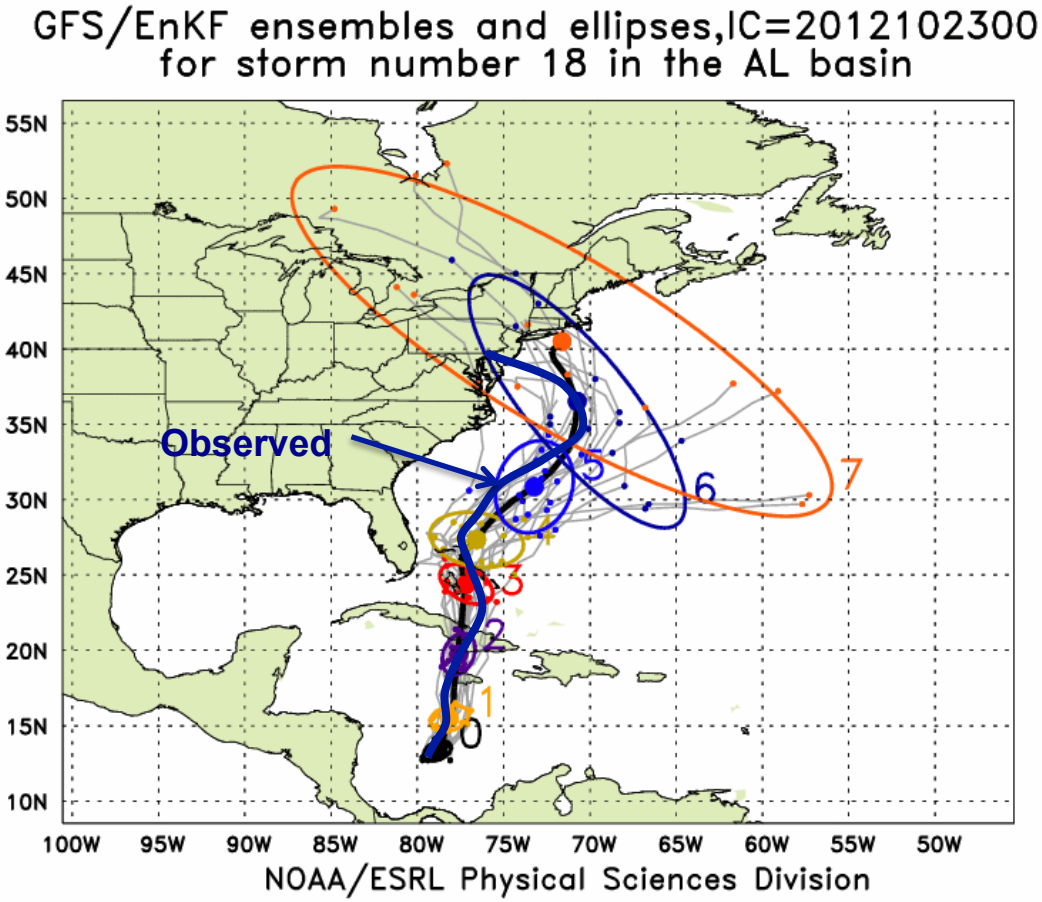
Track:
GFS/EnKF & HWRF

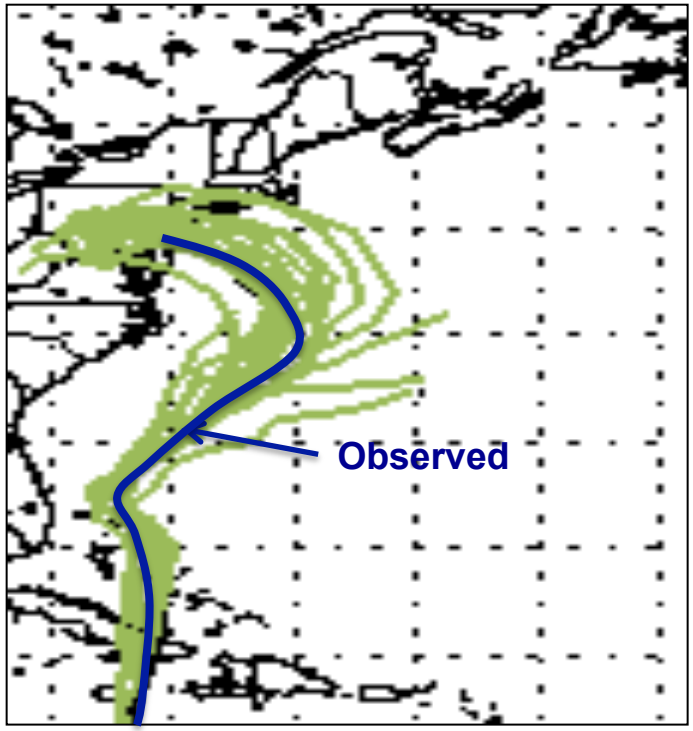
GFS/EnKF T382 20 member ensemble



http://www.esrl.noaa.gov/psd/forecasts/gfsenkf/ens/

HWRF

12Z 23 October – 00Z 29 October



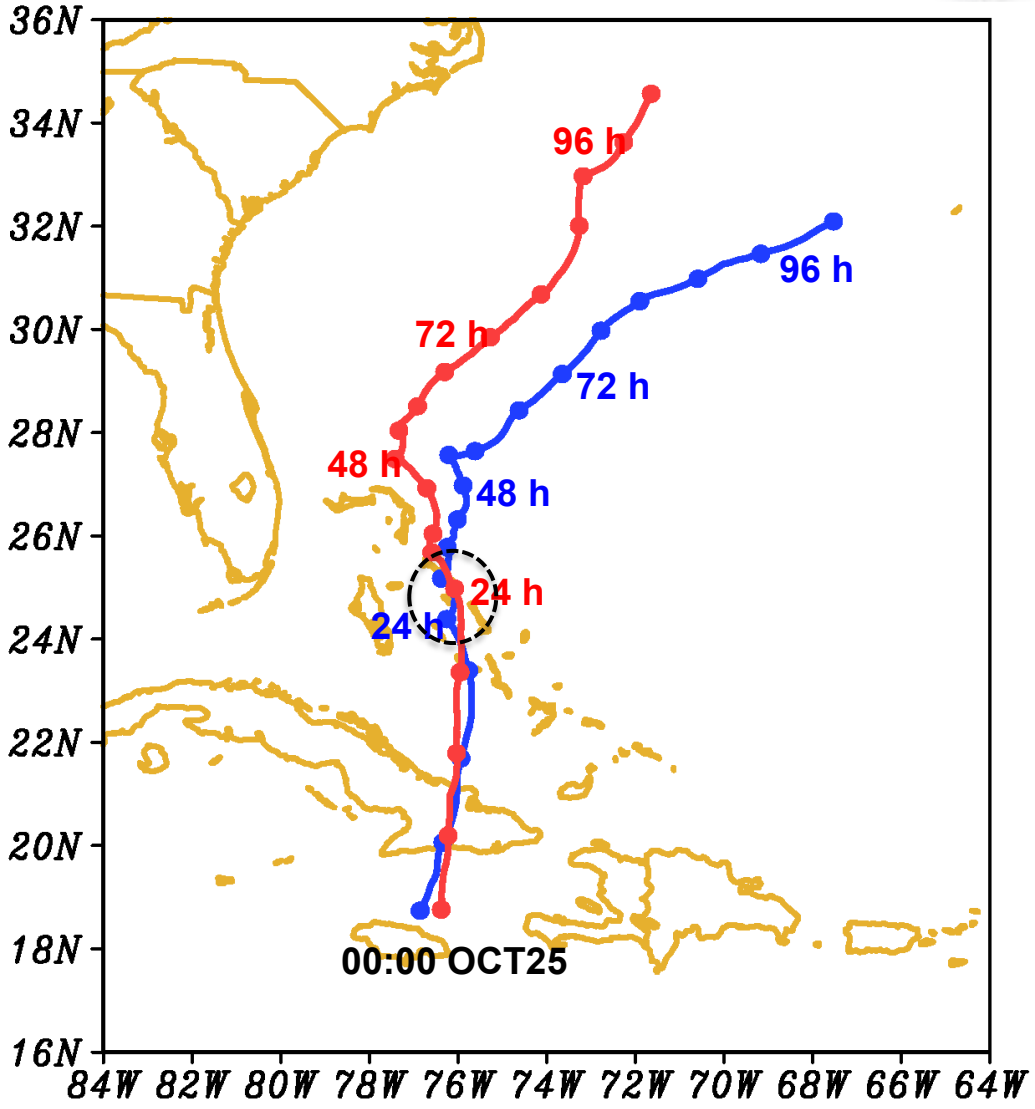
http://www.emc.ncep.noaa.gov/gc_wmb/vxt/

HWRF Track
Start 00Z 25 October

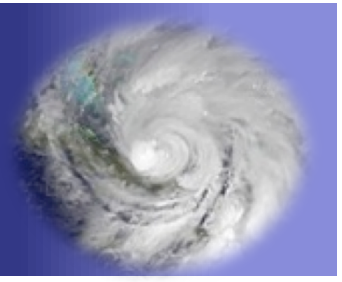
00Z 24 October (blue)

00Z 25 October (red)

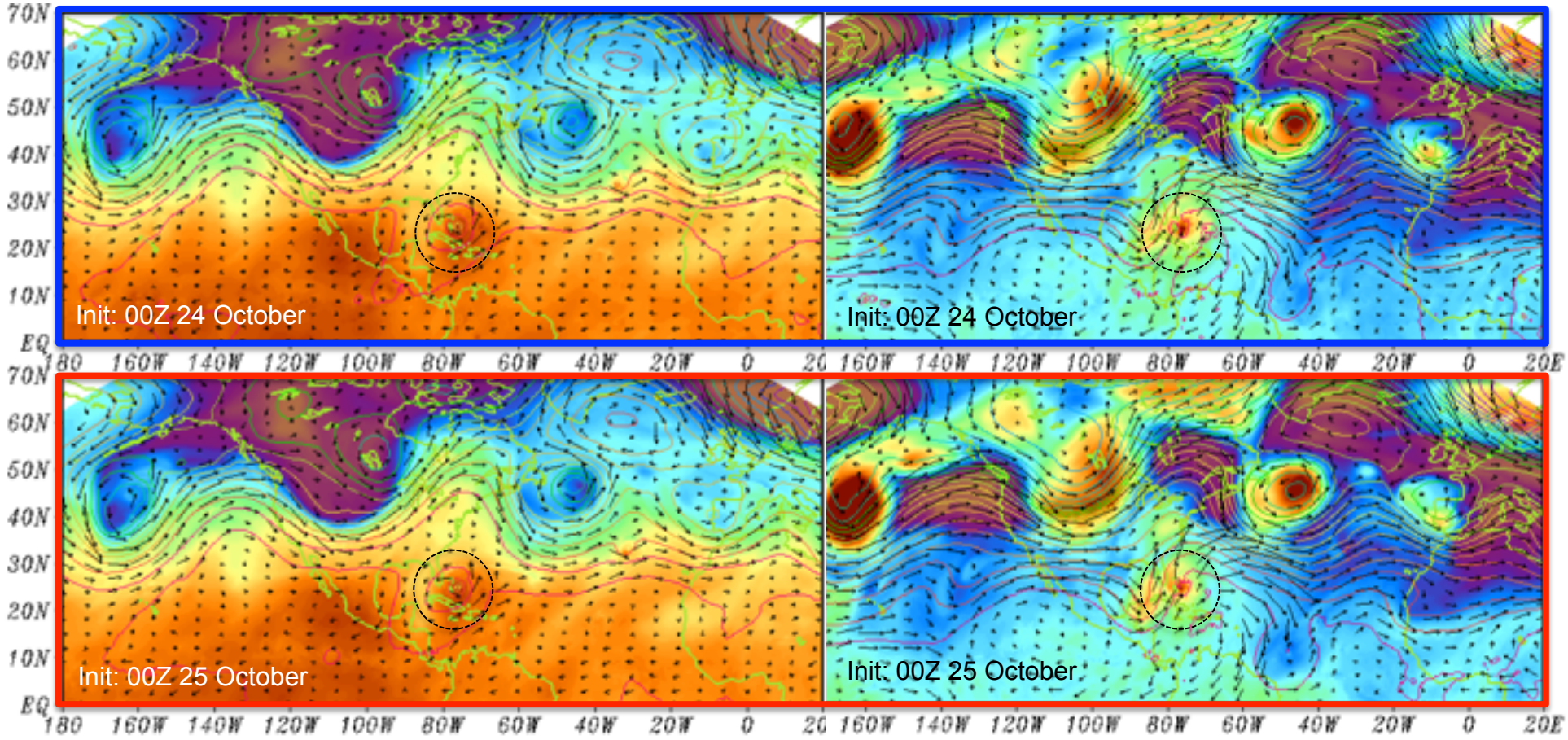
Tracks very similar to 36 h (12Z 26 October)



HWRF 500/200 hPa

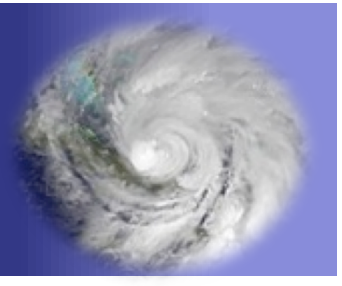


500 hPa **200 hPa**

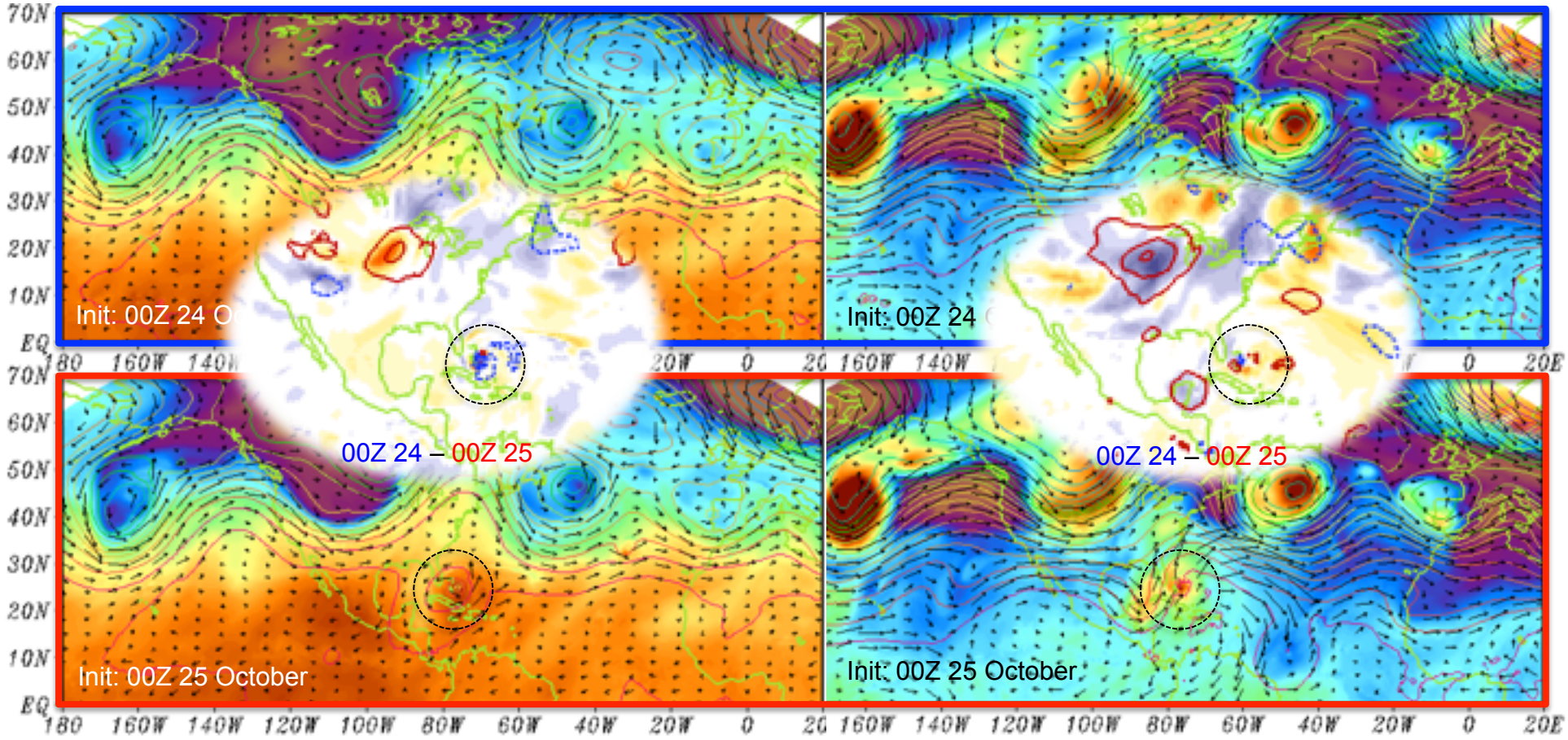


24 h: 00Z 26 October

HWRF 500/200 hPa

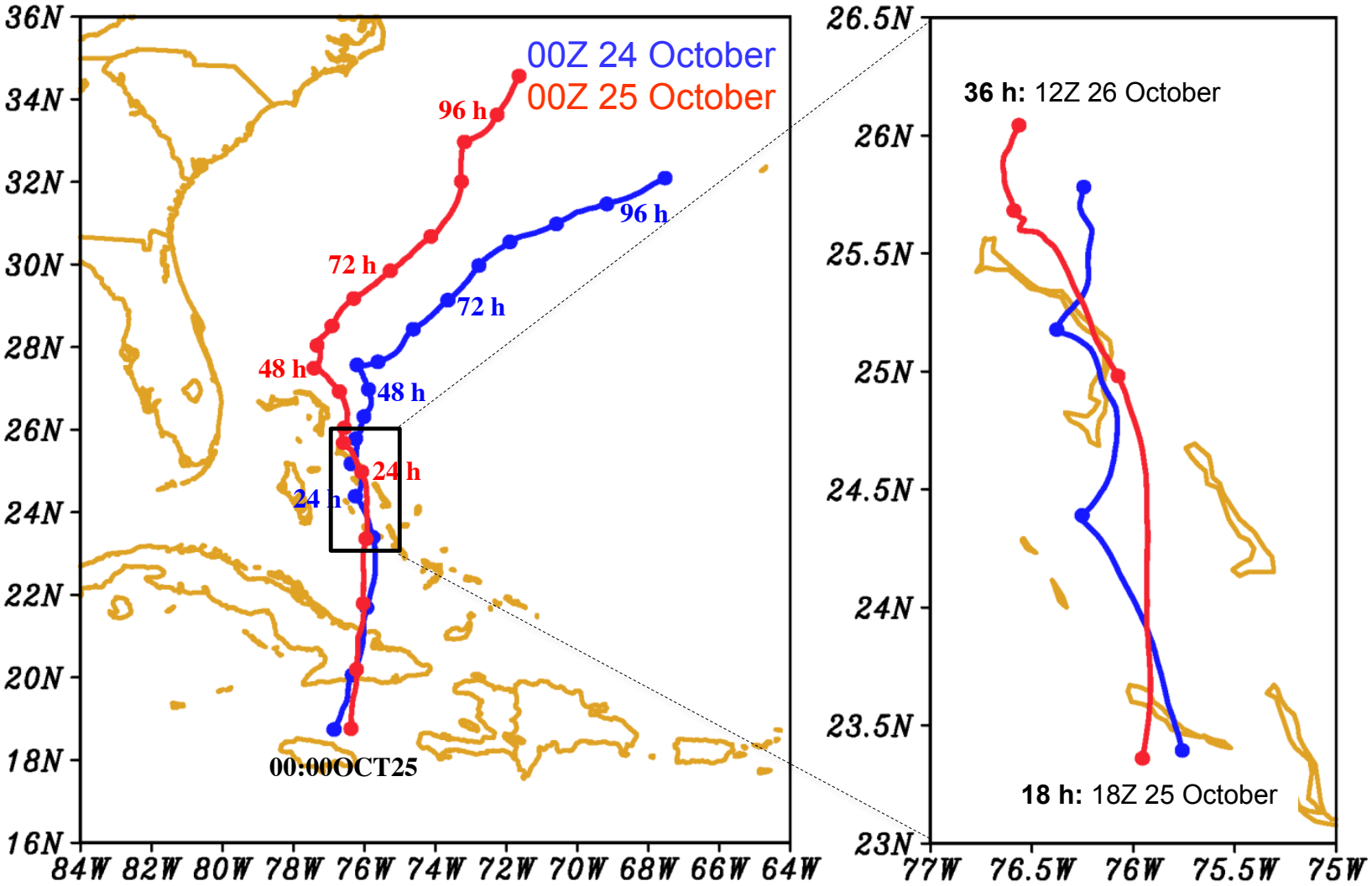


500 hPa **200 hPa**

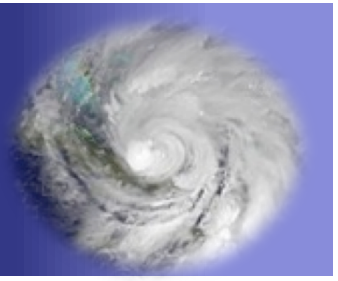


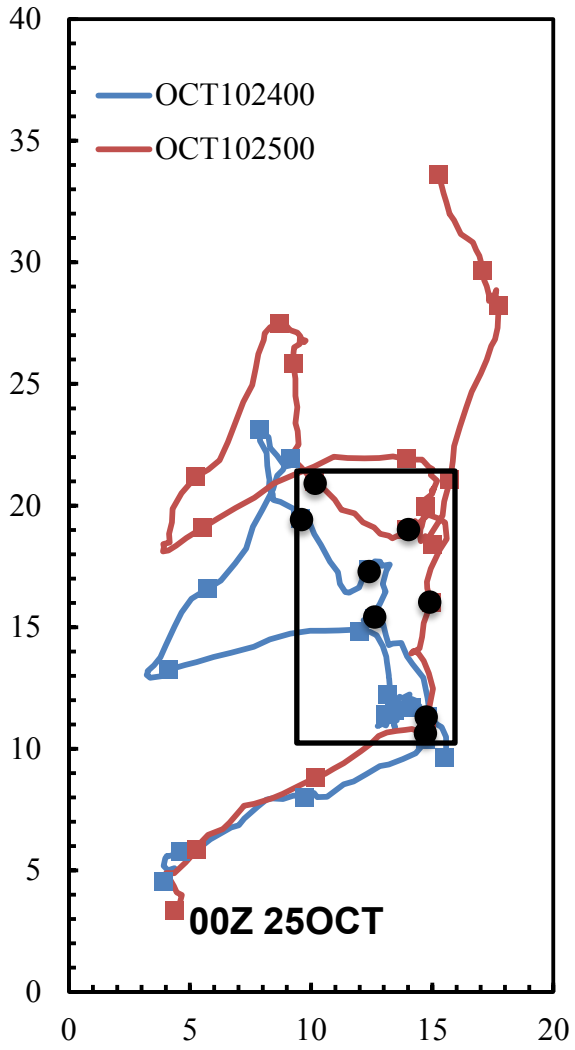
24 h: 00Z 26 October

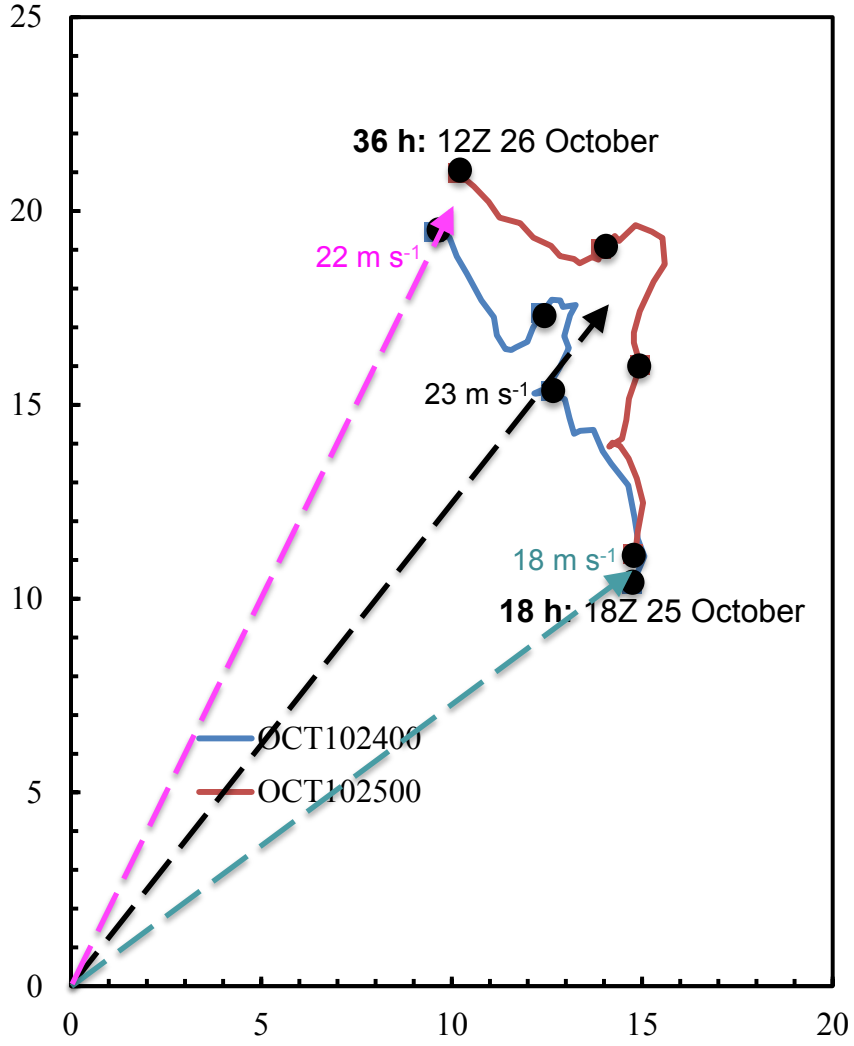
Track
Start 00Z 25 October



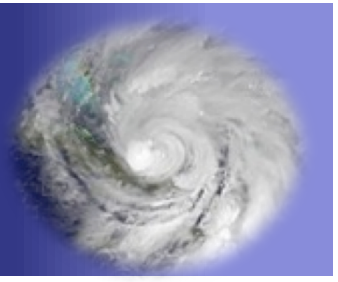
Vertical Wind Shear

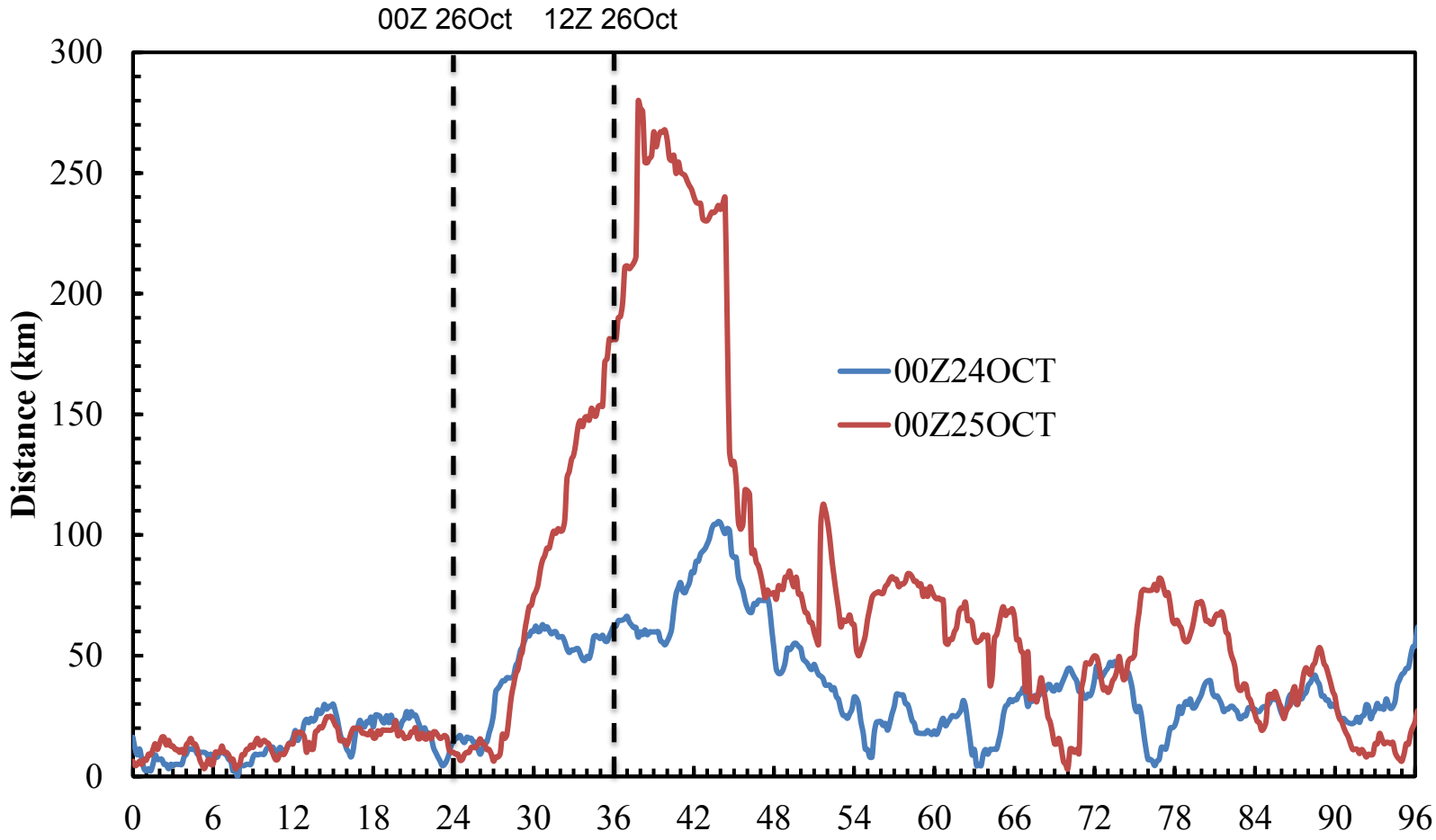






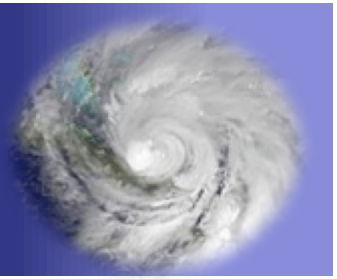
Vortex Tilt
2-8 km Altitude

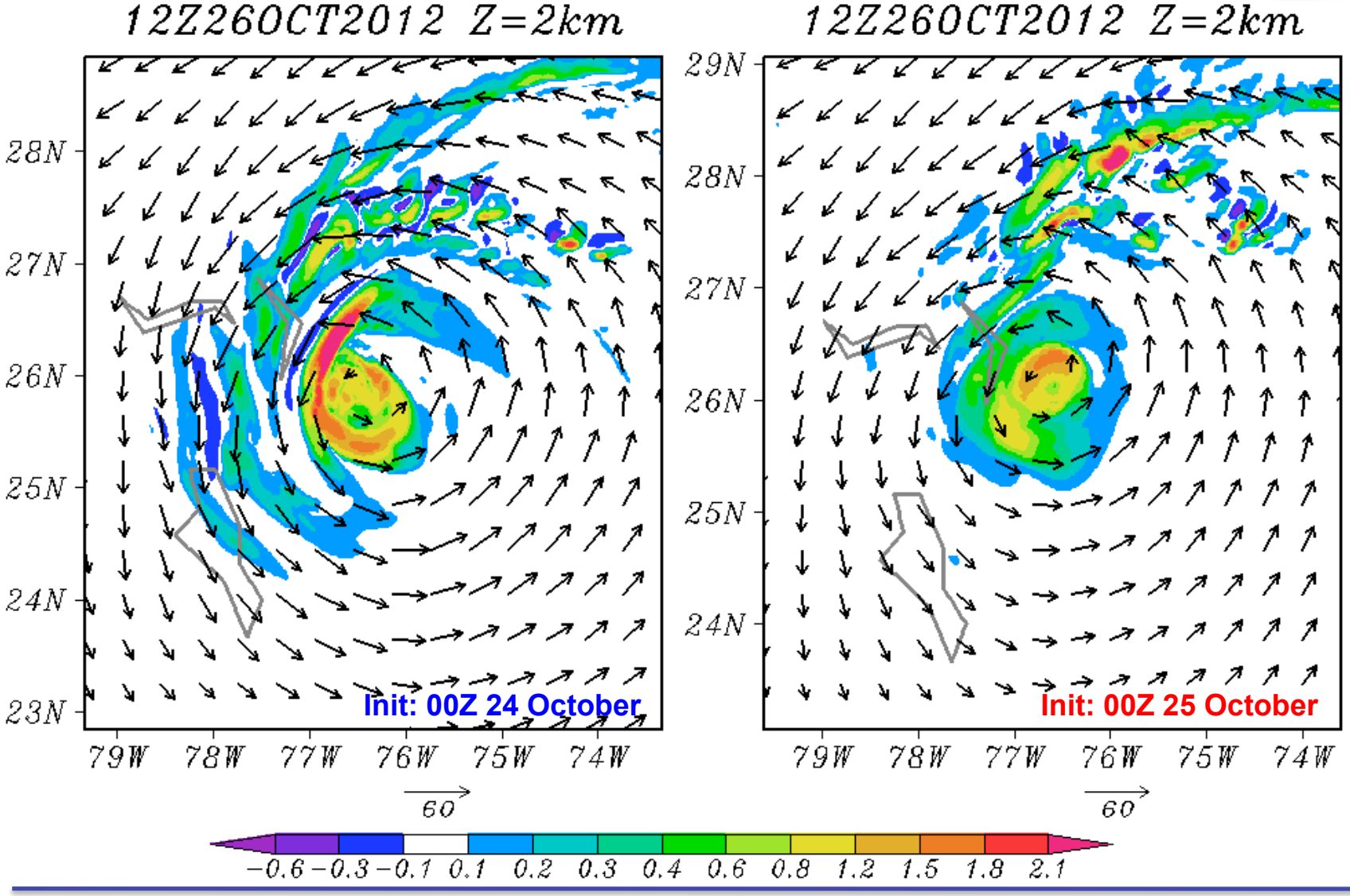




Potential Vorticity

2-8 km Altitude





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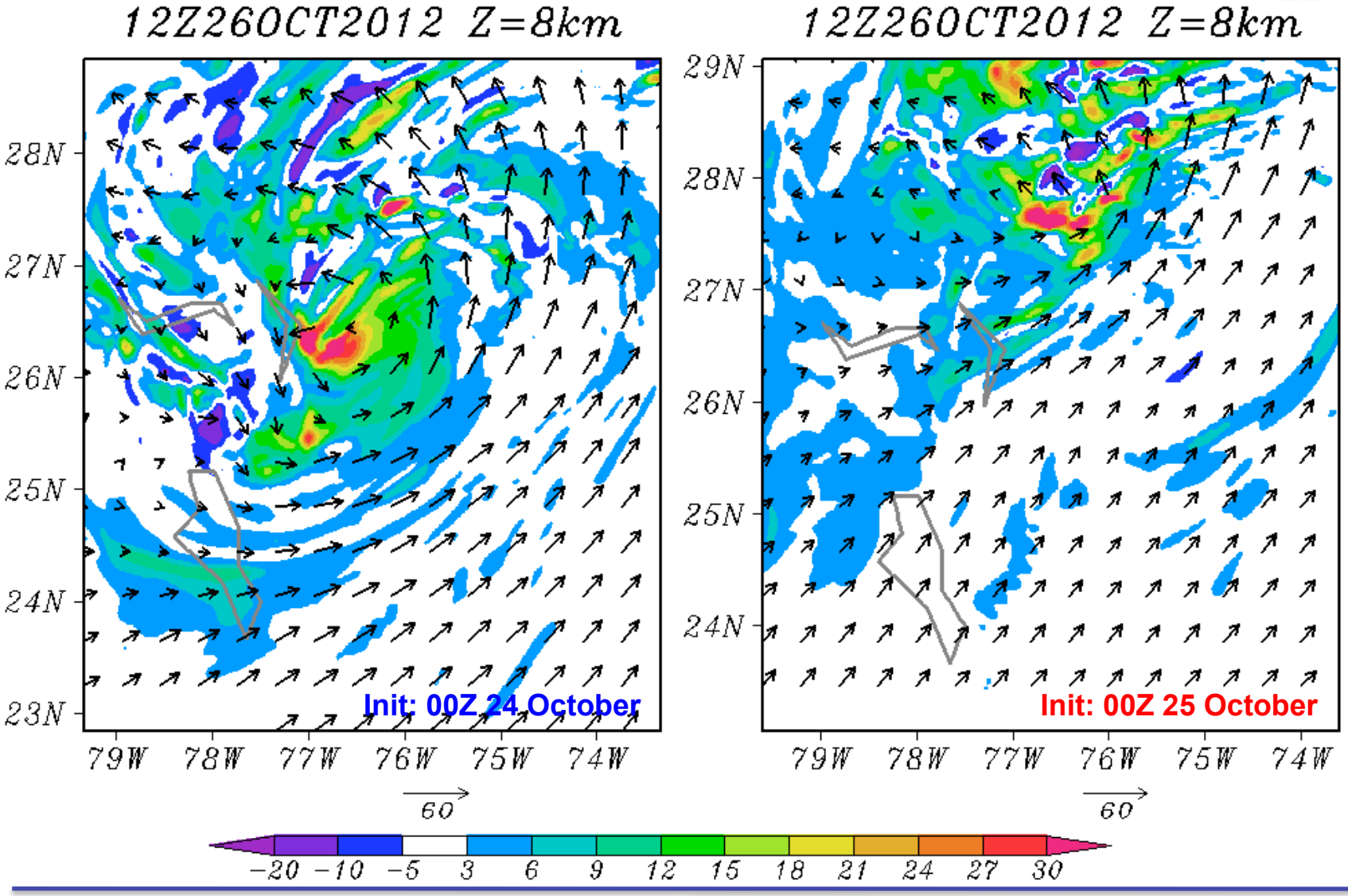
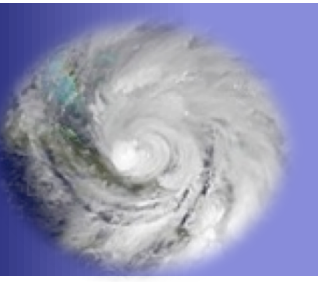
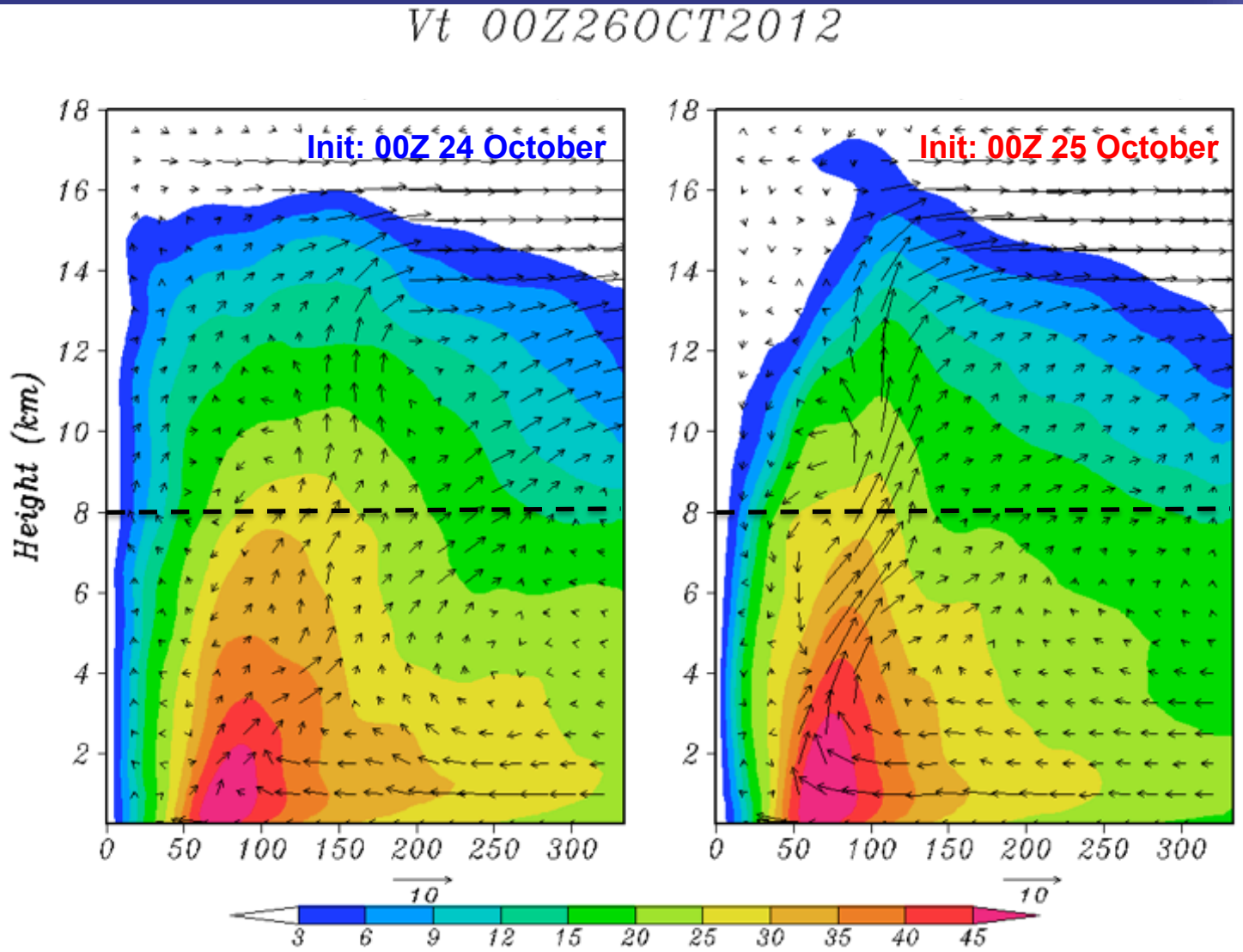
2-8 km Altitude

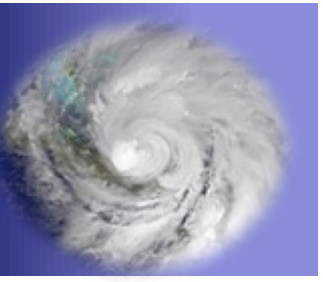


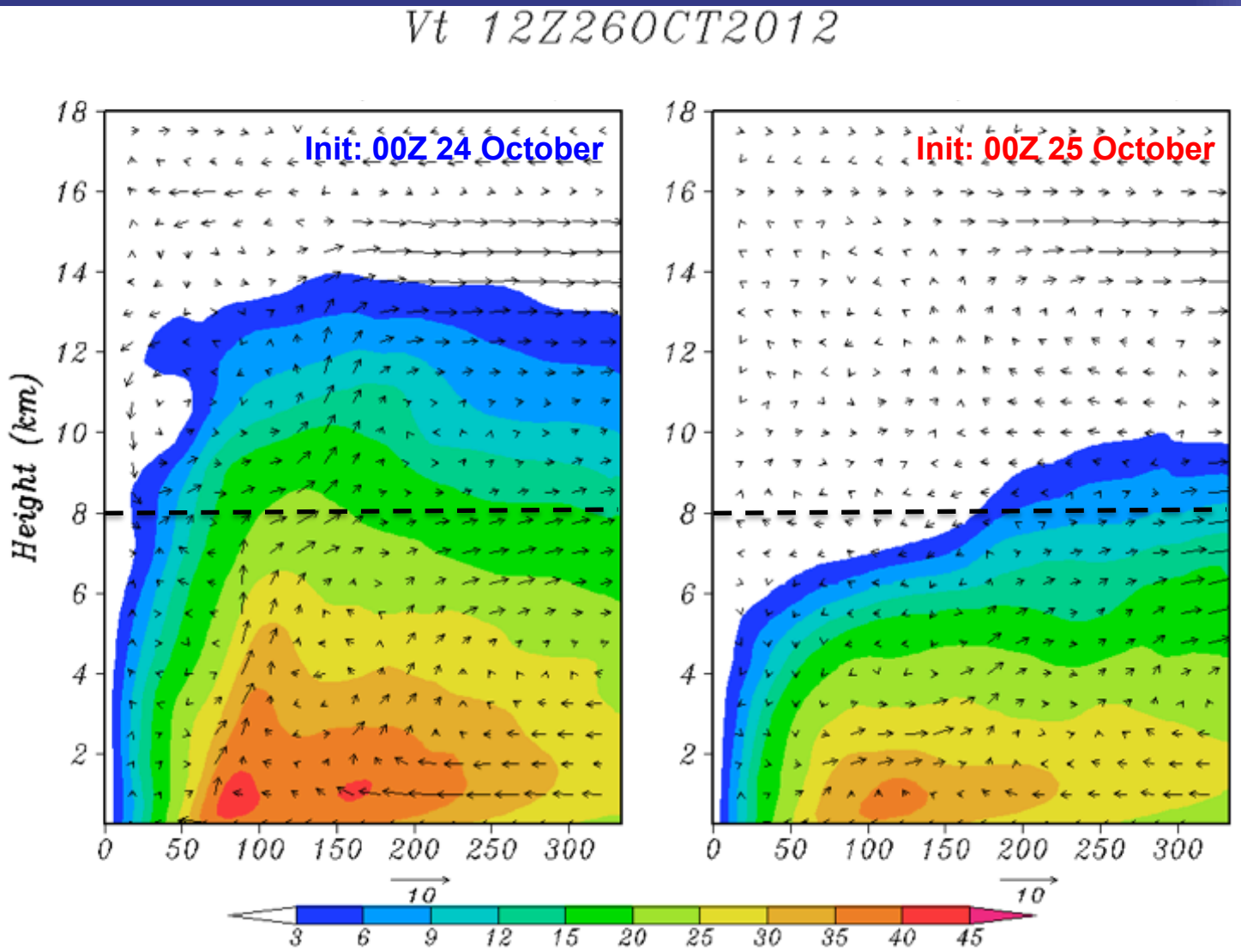
R-Z Mean Tangential Wind



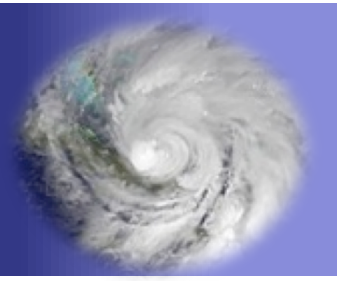


R-Z Mean Tangential Wind

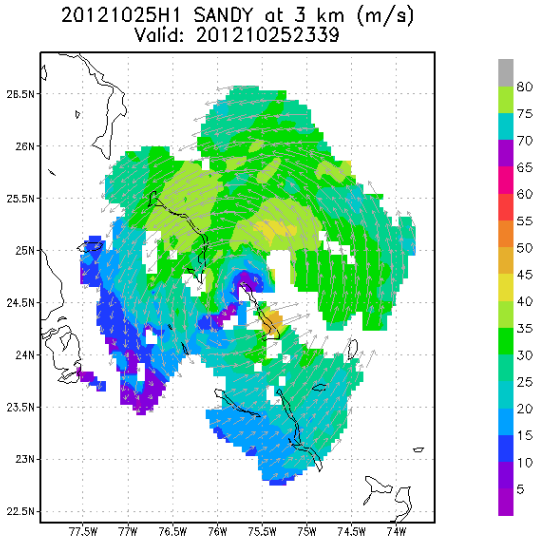


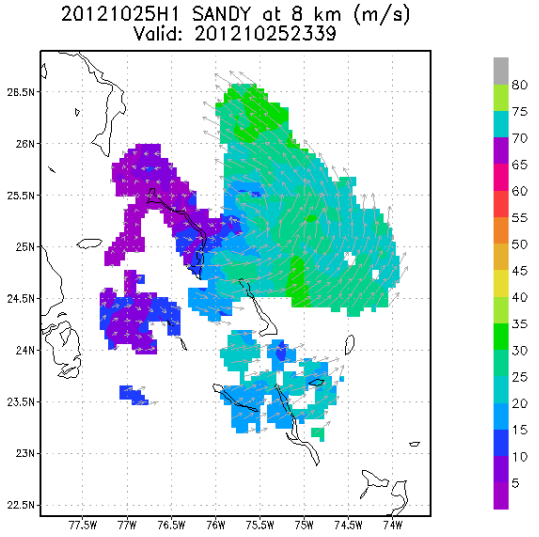


TDR Analyses

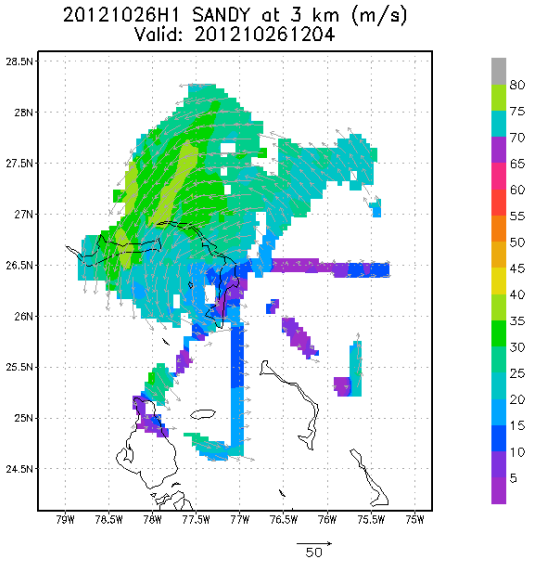


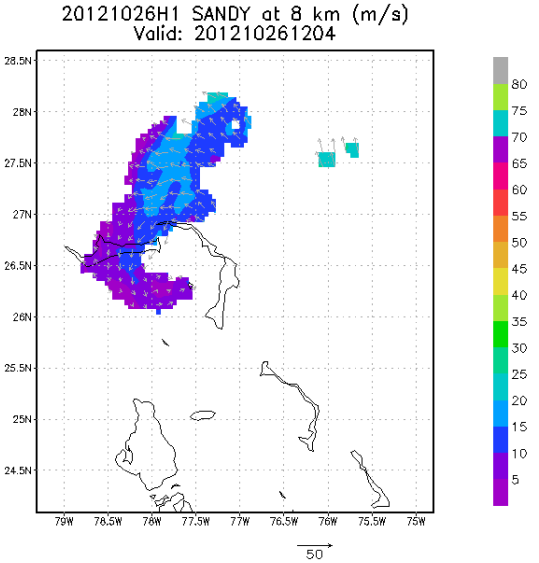
00Z 26 October



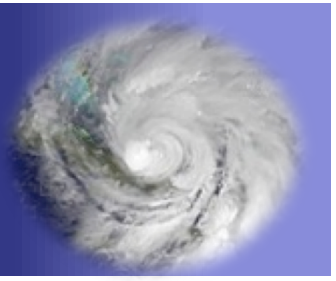


12Z 26 October

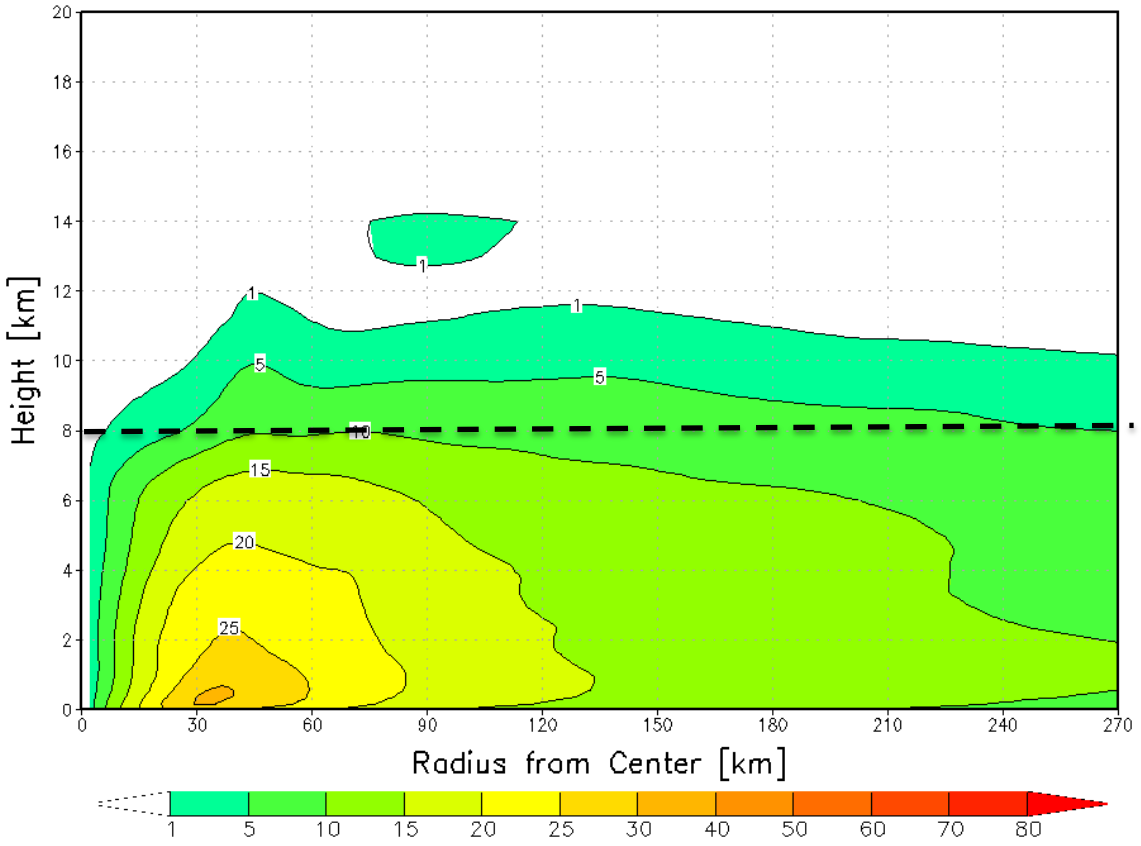




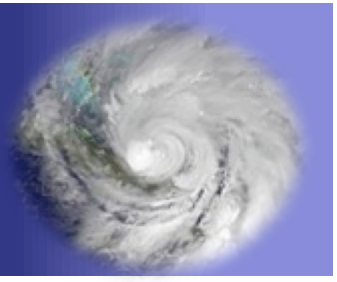
TDR Analyses

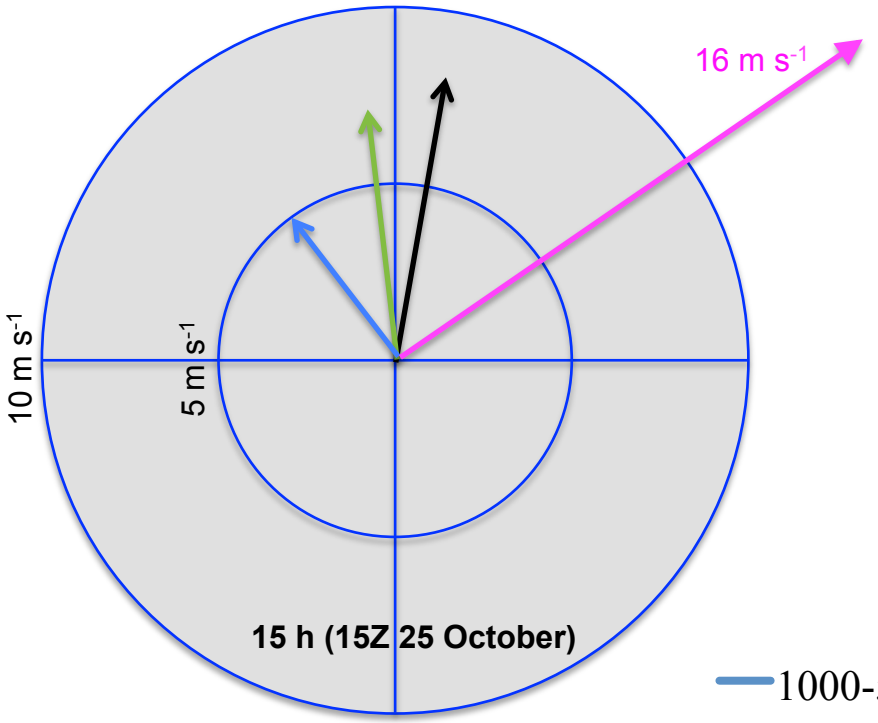


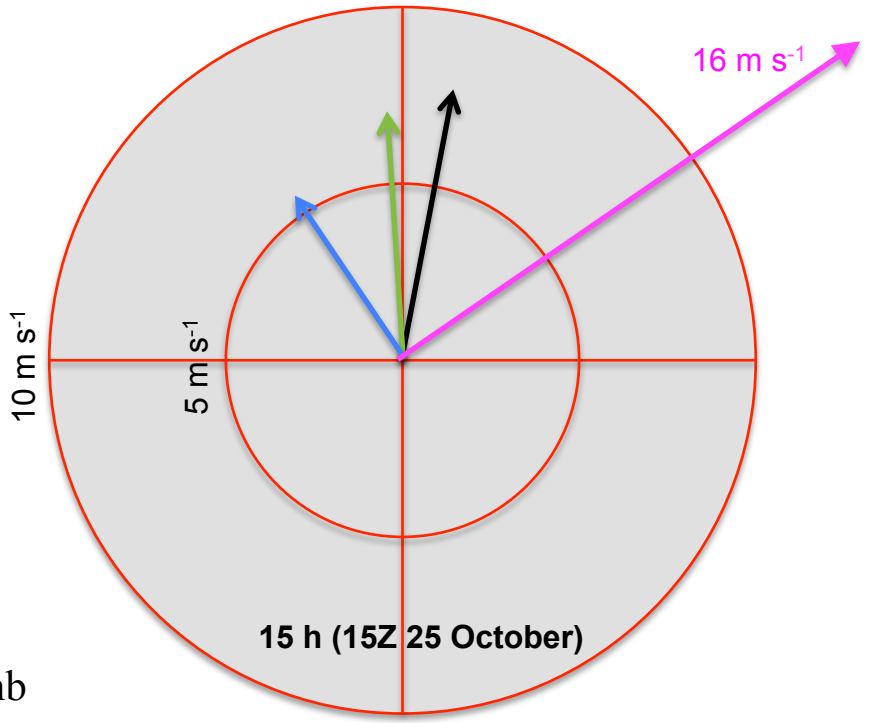
12Z 26 October



Layer Means





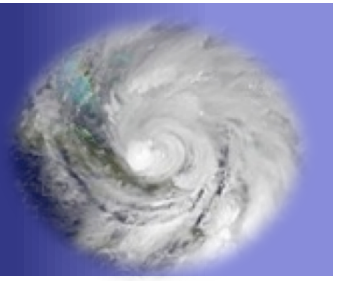


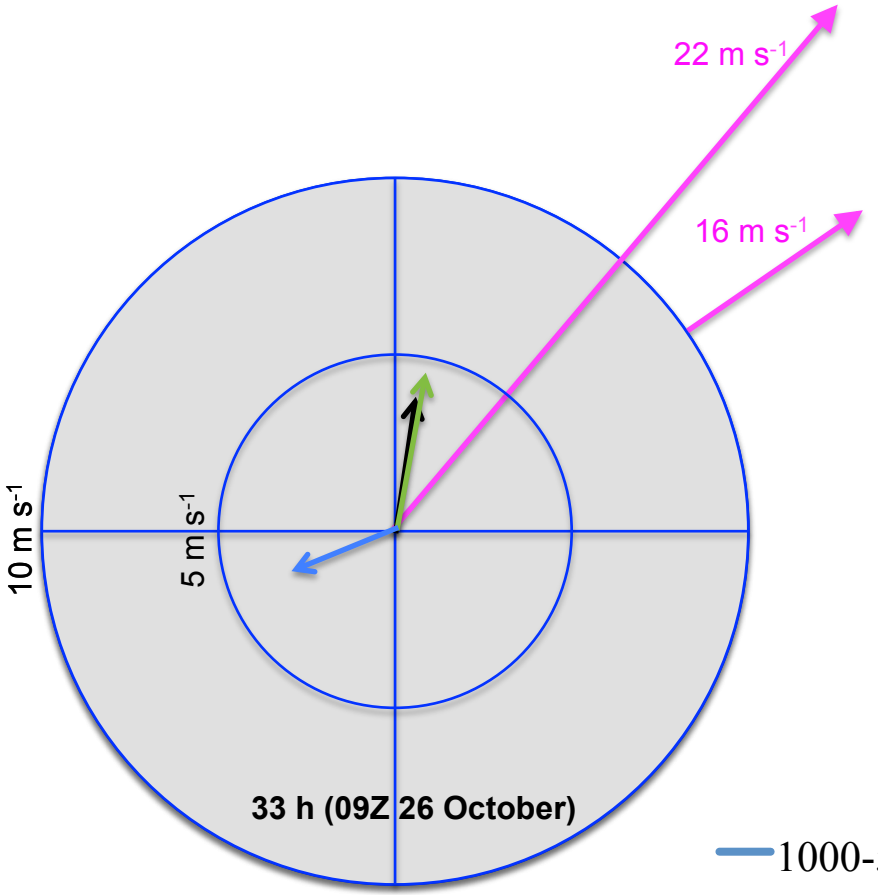
1000-500mb
storm_movement
1000-200mb
850-200mb shear

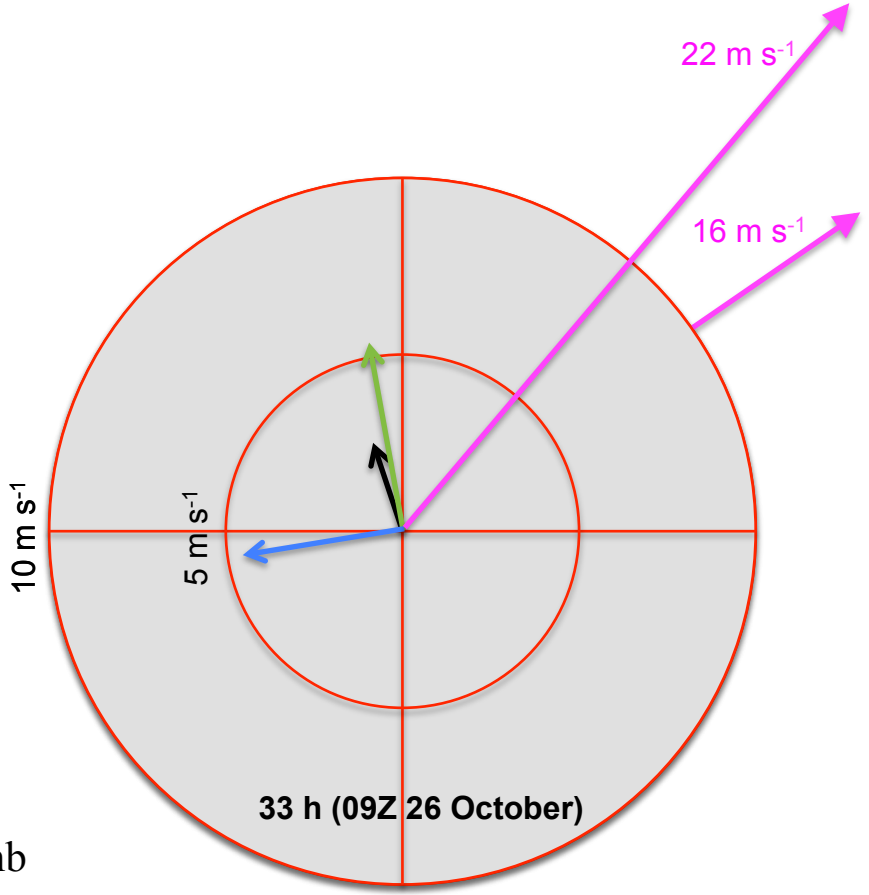
Init: 00Z 24 OCT

Init: 00Z 25 OCT

Layer Means







1000-500mb
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Init: 00Z 24 OCT

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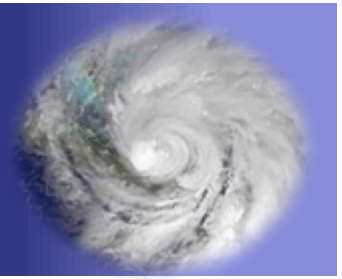
Summary



- Two HWRF simulations initialized 24 h apart have similar tracks and intensity until 06Z 26 October
  - Large scale similar at 500 hPa, but 200 hPa trough over GOM further east and stronger in early run
  - Early run has stronger, slower storm, while later run storm further north
  - Shear over both storms identical from SW at ~20 m s^{-1}
- Track and intensity differences result of differences in vortex-shear interaction
  - Both storms interact with very strong sheer from 18Z 25 to 12Z 26 Oct.
  - Storm with track closer to observed became shallower (as observed), altering steering flow from SSW to SSE
  - Change in steering led to track bifurcation

Questions?