



Behavior and Trends of the Extratropical Transition Process and the Influence of External Environmental Factors: Progress Update

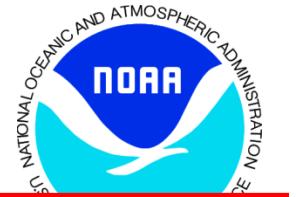
Zorana Jelenak, Faozi Said, Seubson Soisuvarn, Joe Sapp, Suleiman Alsweiss
and Paul S Chang

NOAA/NESDIS/STAR
Joseph Sienkiewicz
NOAA/NWS/OPC

- Database
 - 2007–2015 Extratropical Transitions and 2000–2015 Extratropical Cyclones
 - Radiometer data
 - RSS TMI, SSMI, WindSat, AMSR-E, AMSR-2 and GMI
 - Scatterometer data
 - JPL: QuikSCAT, OSCAT, RapidScat wind
 - NOAA: QuikScat, OSCAT, ASCAT-A and B
 - RSS: ASCAT-A

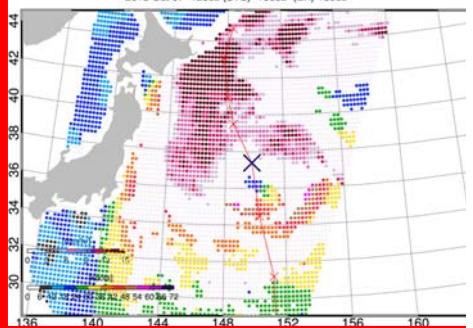
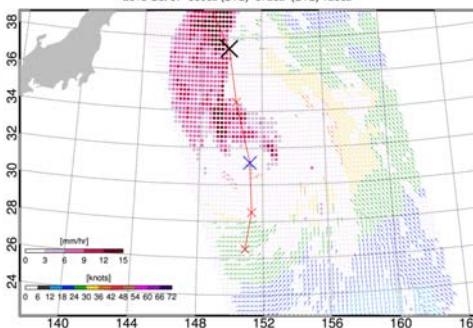
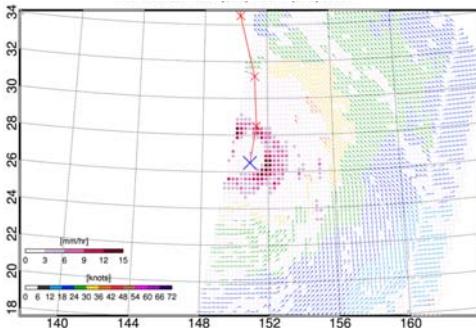
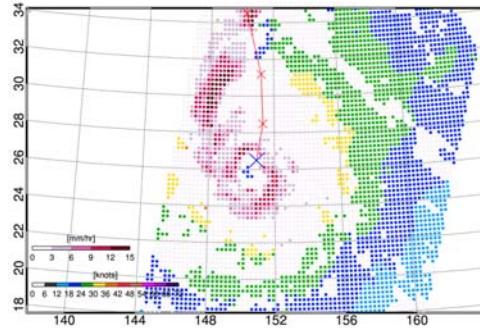


Extratropical transition West Pacific 06–08 October 2015 Radiometer Observations



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AMSR 10071609

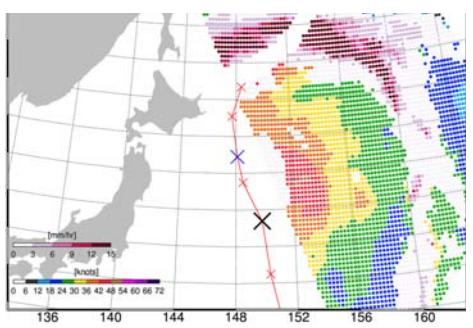
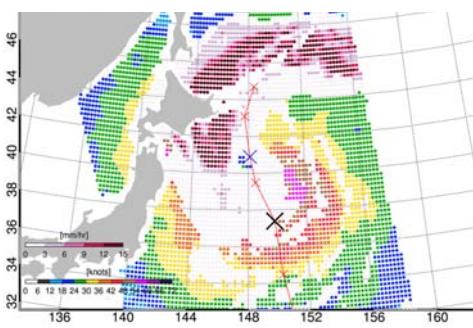
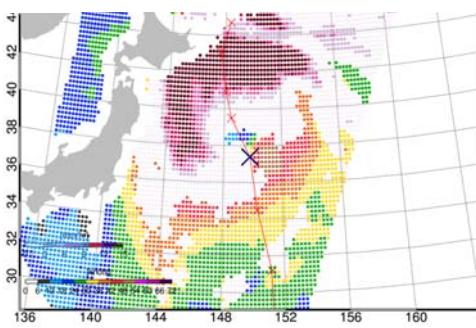
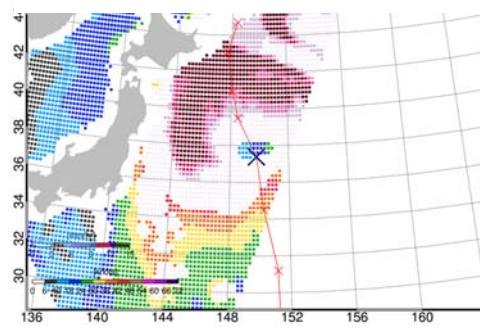


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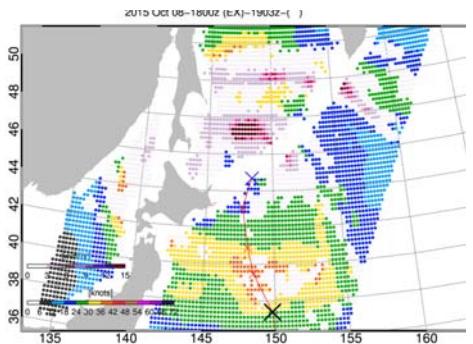
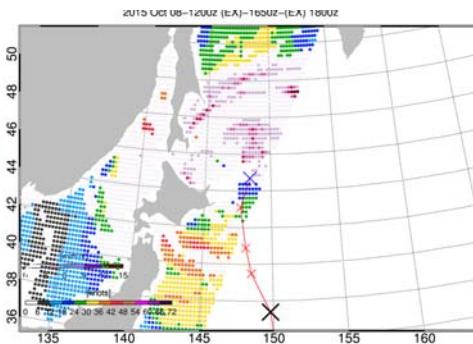
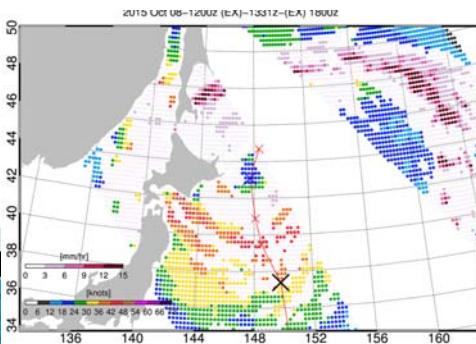
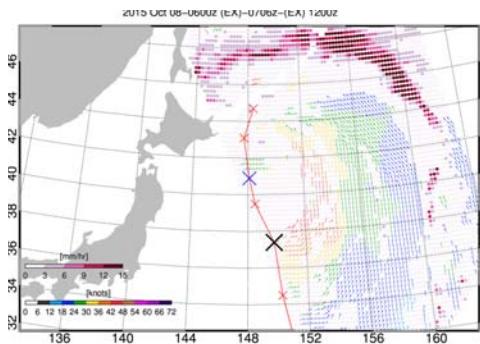


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GMI 10081331

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SSMIF16 10081903





ExtraTropical Transition West Pacific 06–08 October 2015 Scatterometer Observations

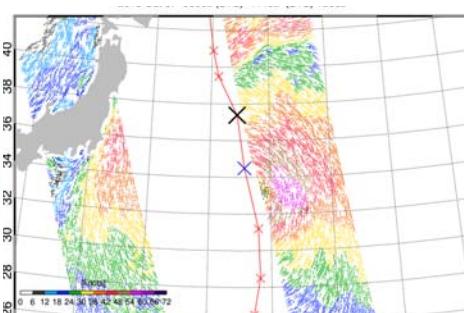
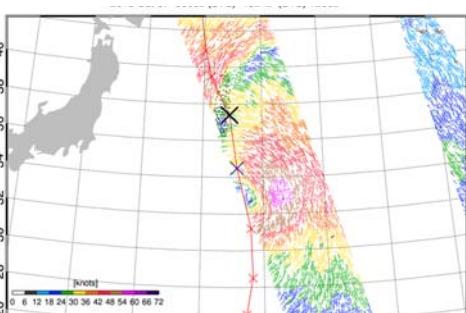
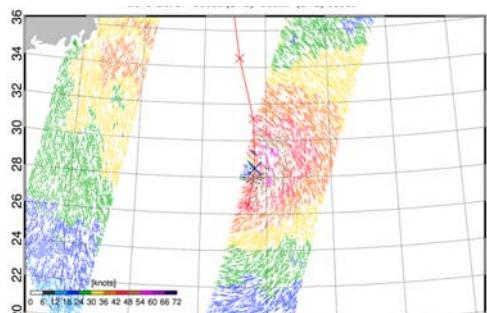
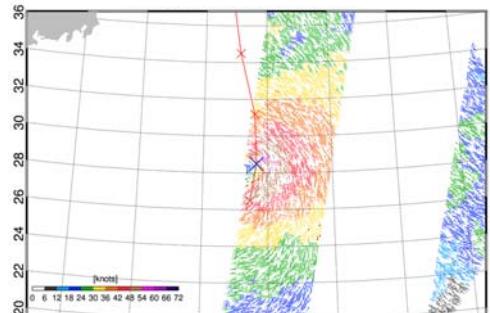


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ASCAT-A 10071024

ASCAT-B 10071119

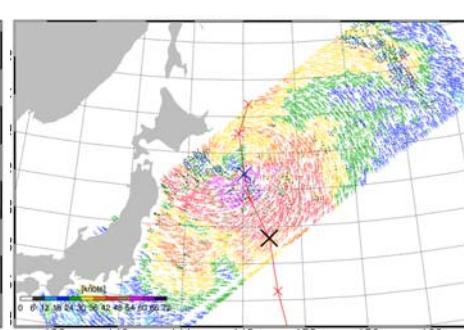
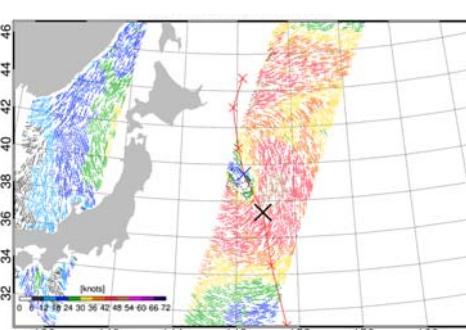
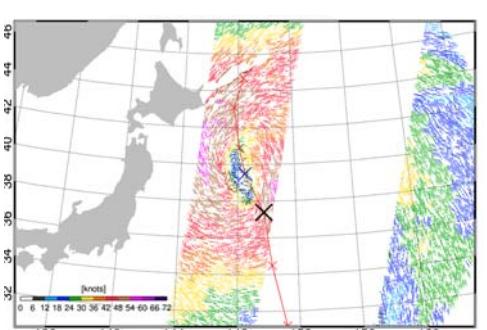
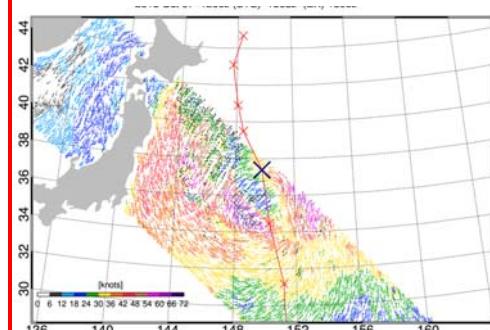


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ASCAT-B 10072339

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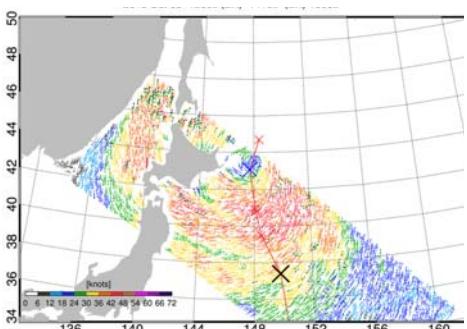
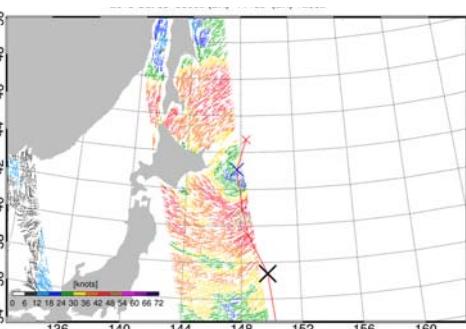
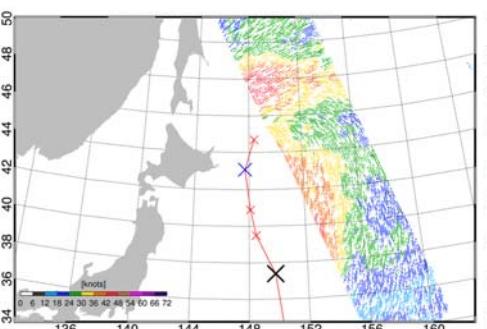
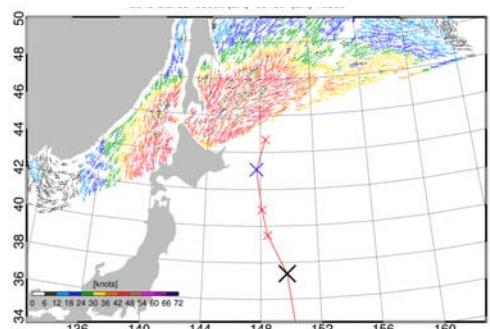


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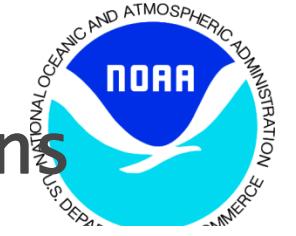
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ExtraTropical Transition West Pacific 06–08 October 2015 scatterometer + Radiometer Observations

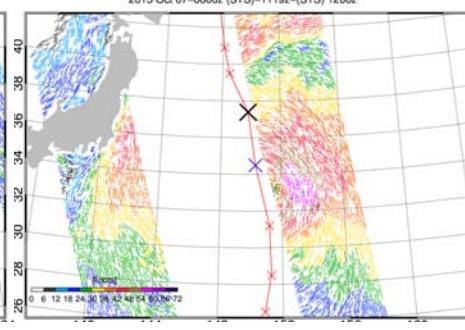
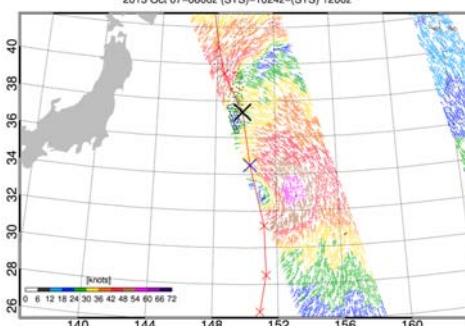
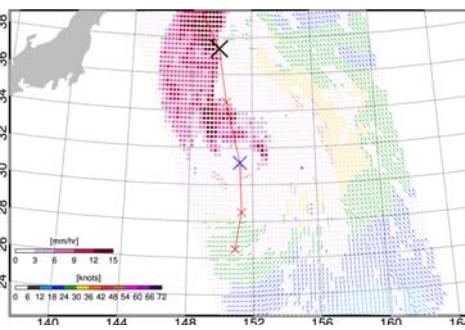
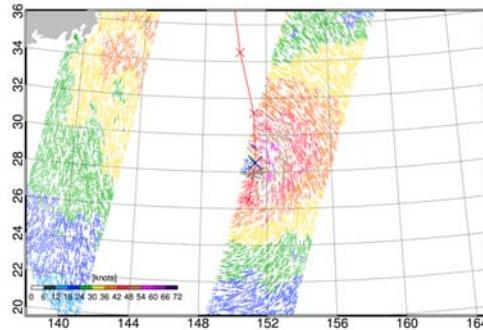


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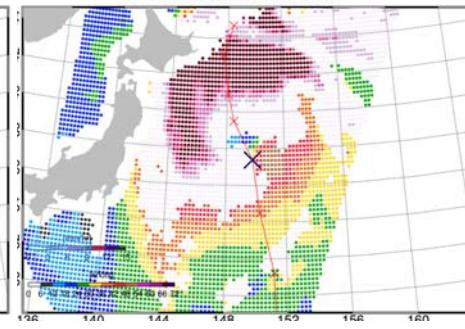
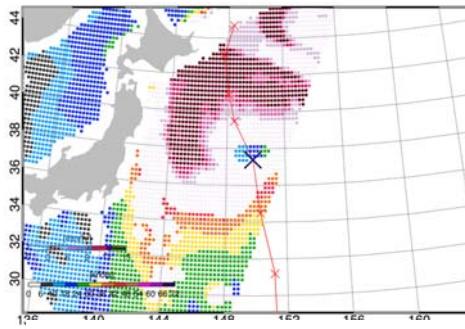
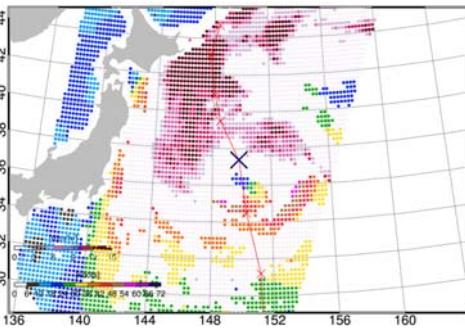
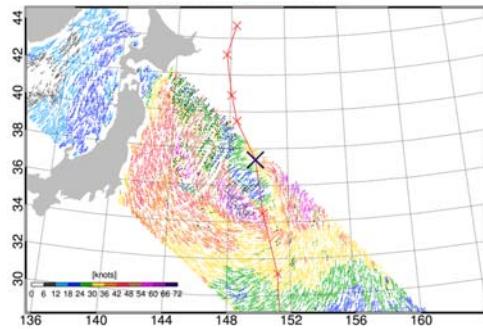


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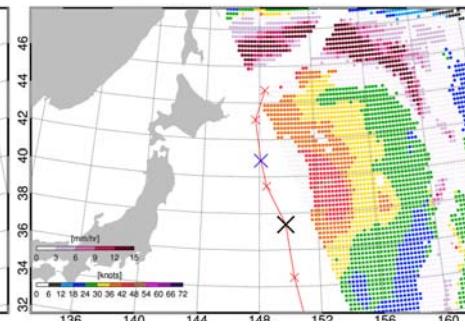
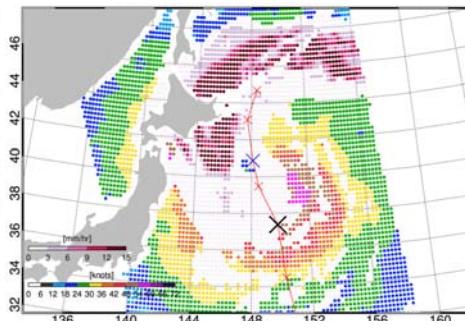
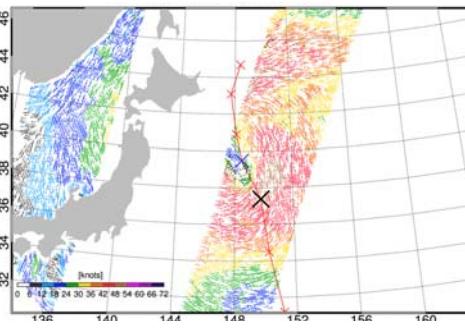
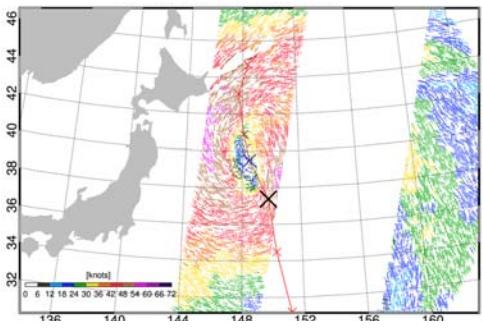


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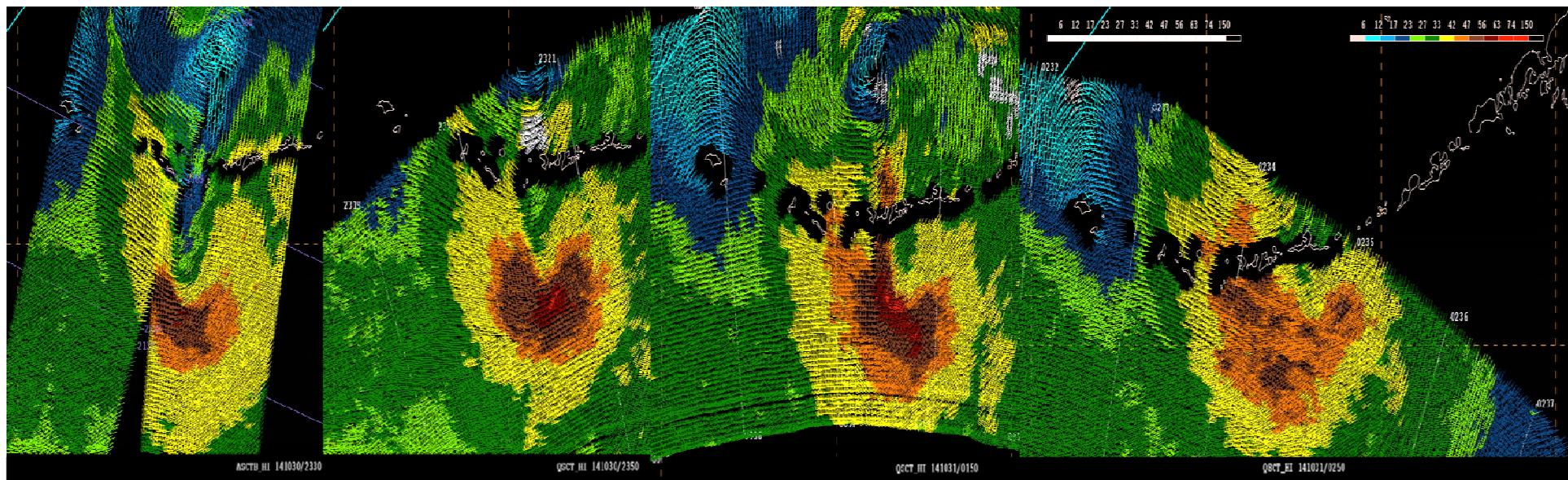
High Temporal Resolution of RapidScat Extratropical Storm Observations

ASCAT-B 20141030
2128z and 2306z

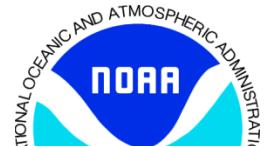
RapidScat
20141030 2321z

RapidScat
20141031 0057z

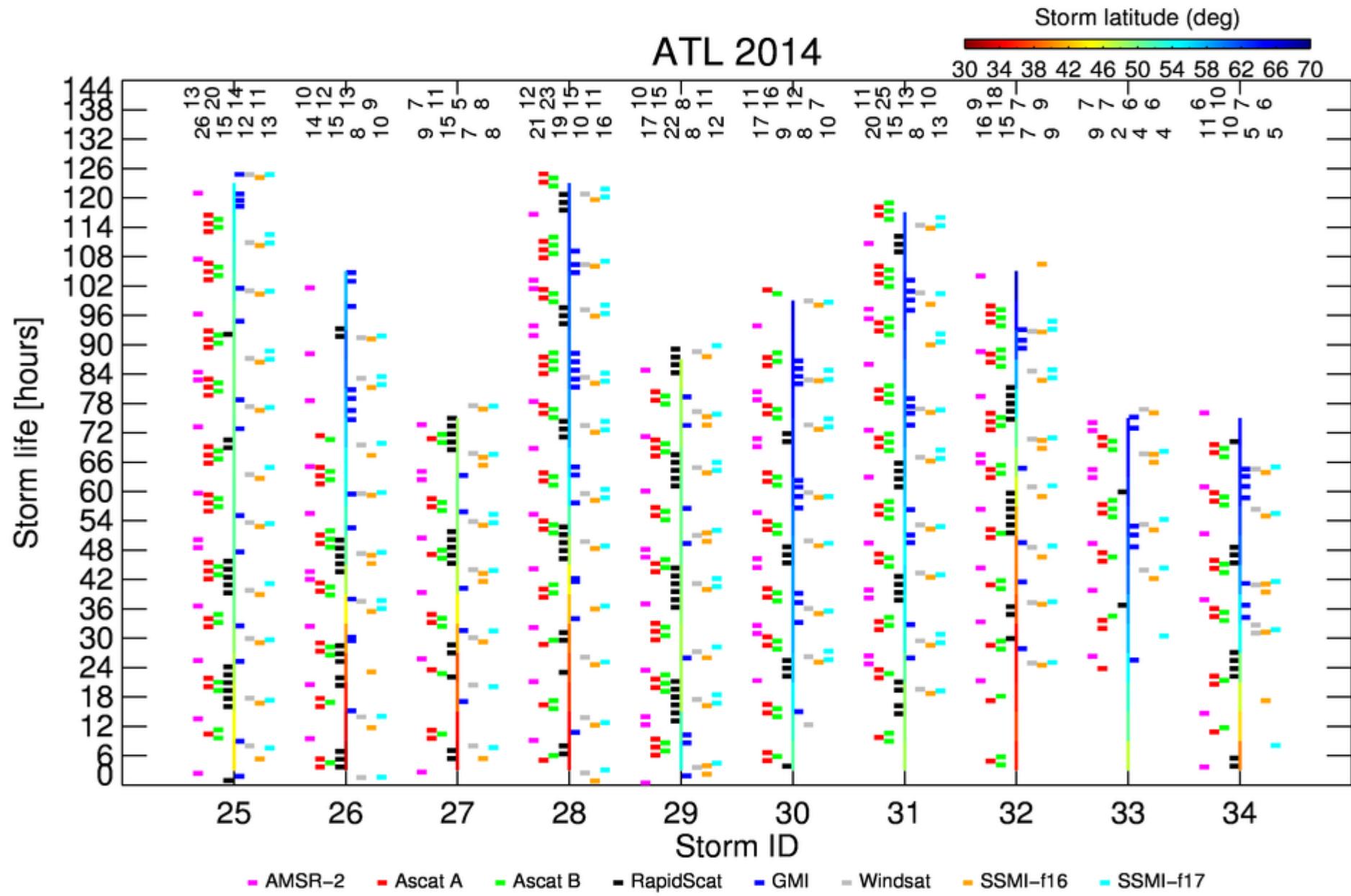
RapidScat
20141031 0235z



RapidSCAT observations greatly aided in our ability to study temporal changes of the windfield of extratropical cyclones. When observations are available we have ability to study changes within one hour. Previously we were able only to characterize changes every 6h.

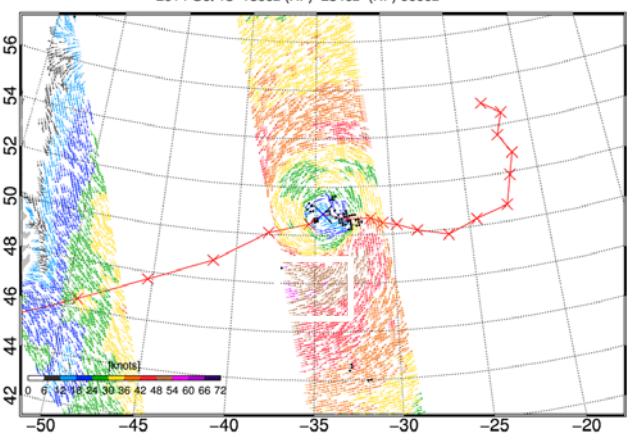
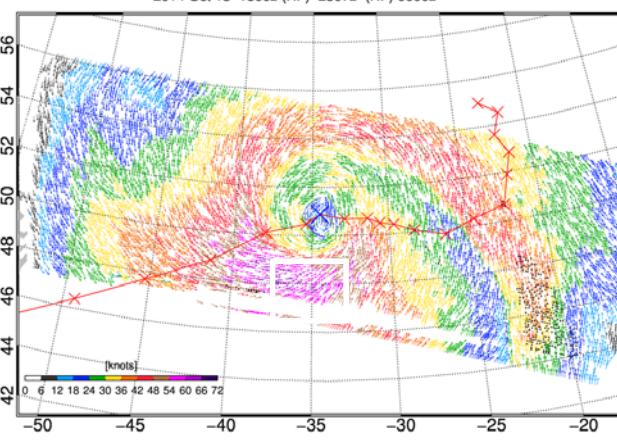
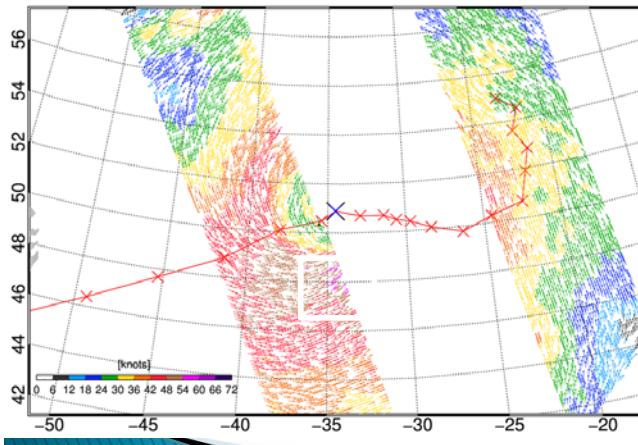
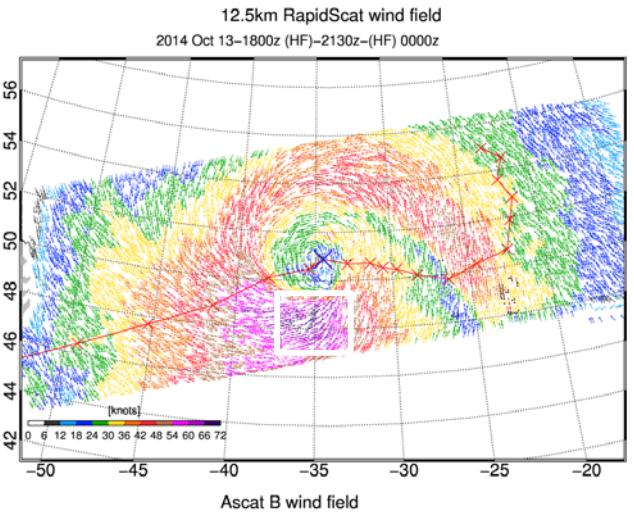
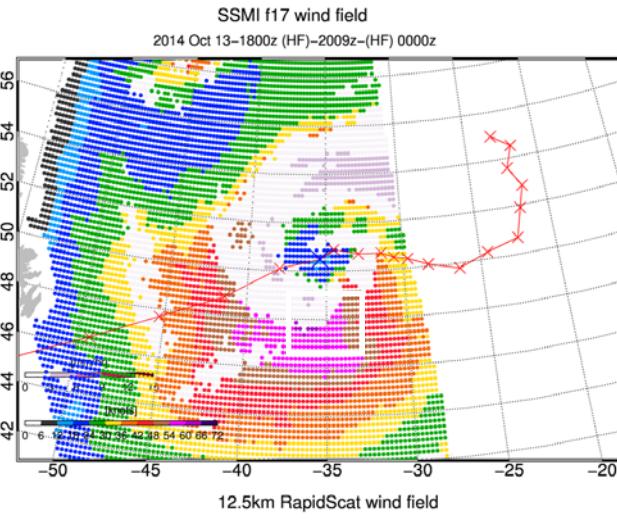
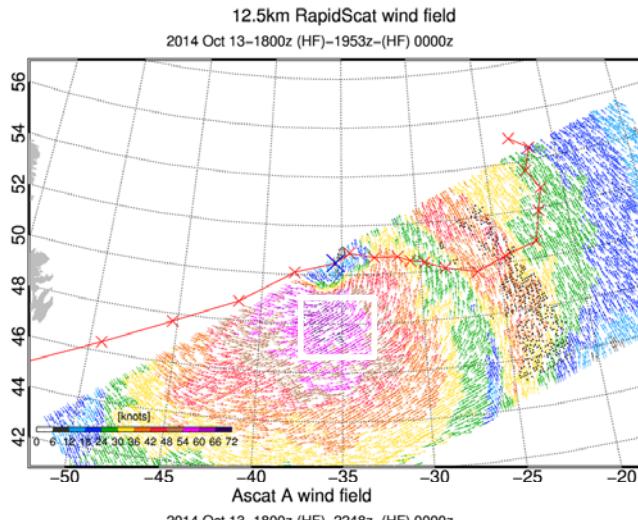


Frequency of Observations



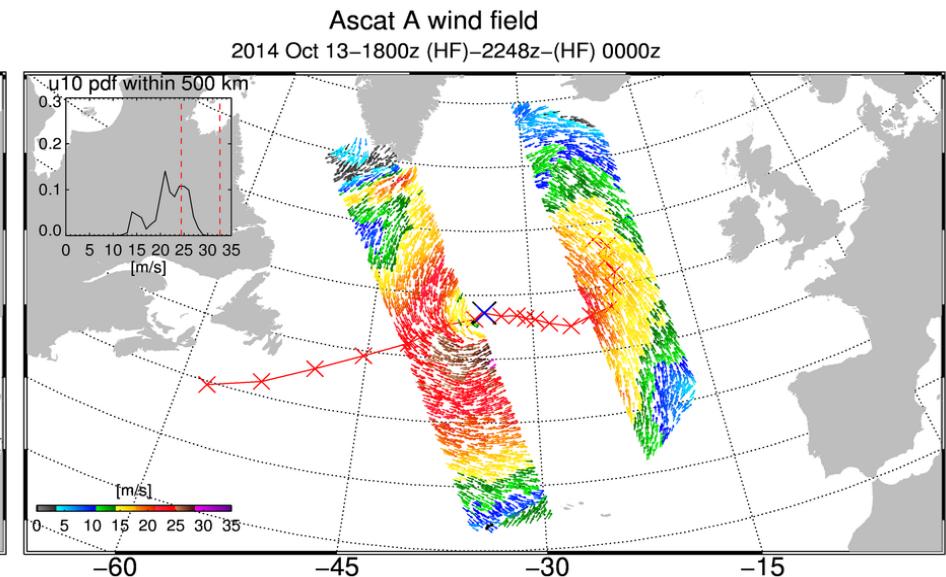
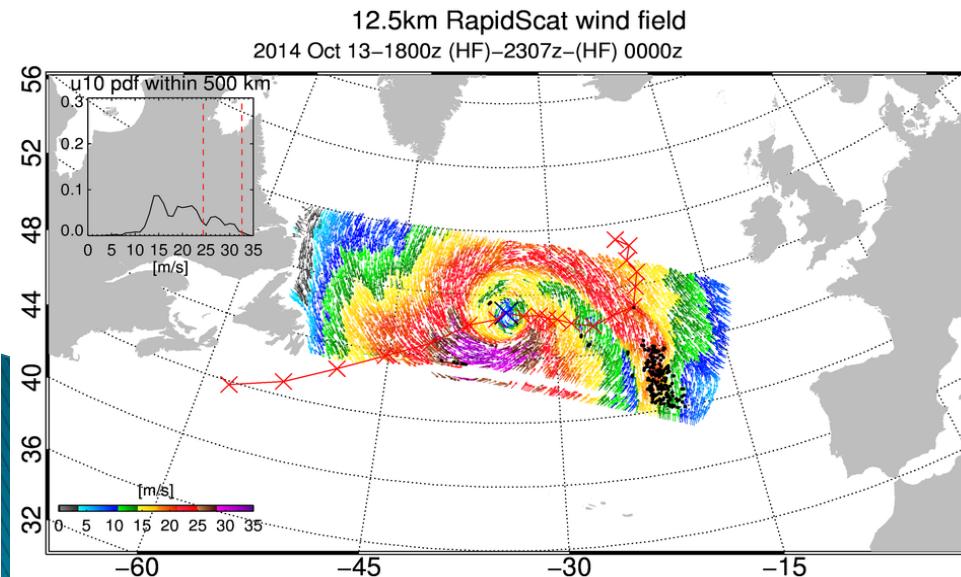
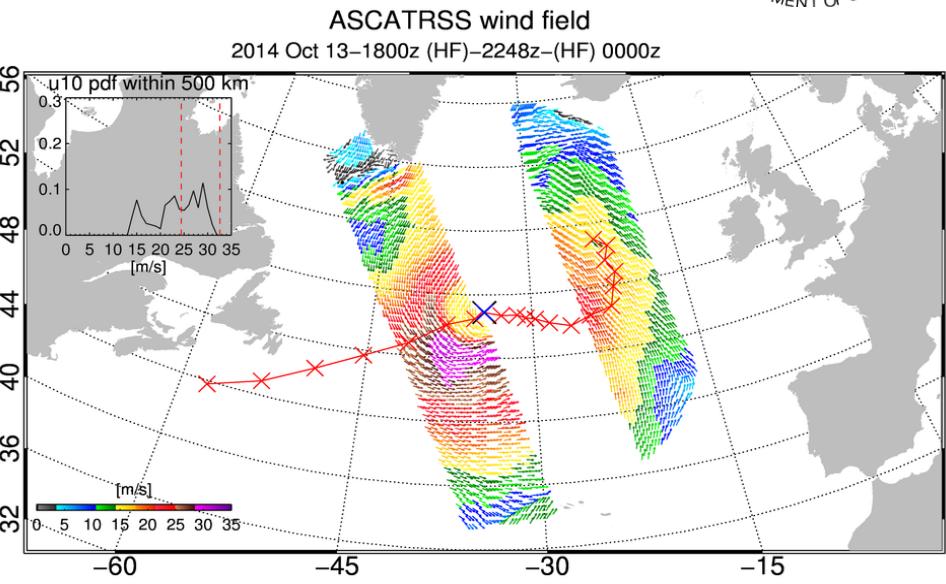
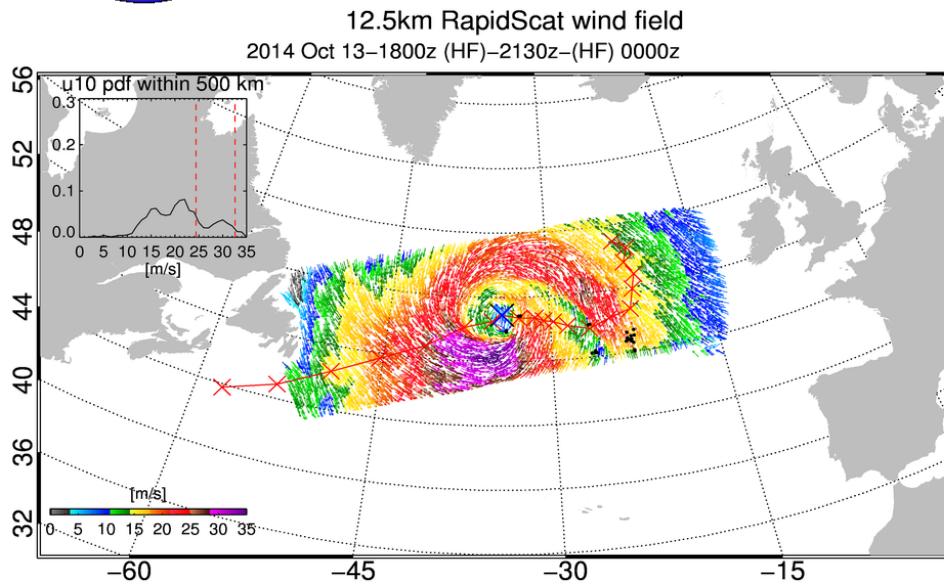


Rapid Changes in Wind Field Model Function Effect or Real Event?





RSS and NOAA ASCAT Winds





Validating High Winds with SFMR

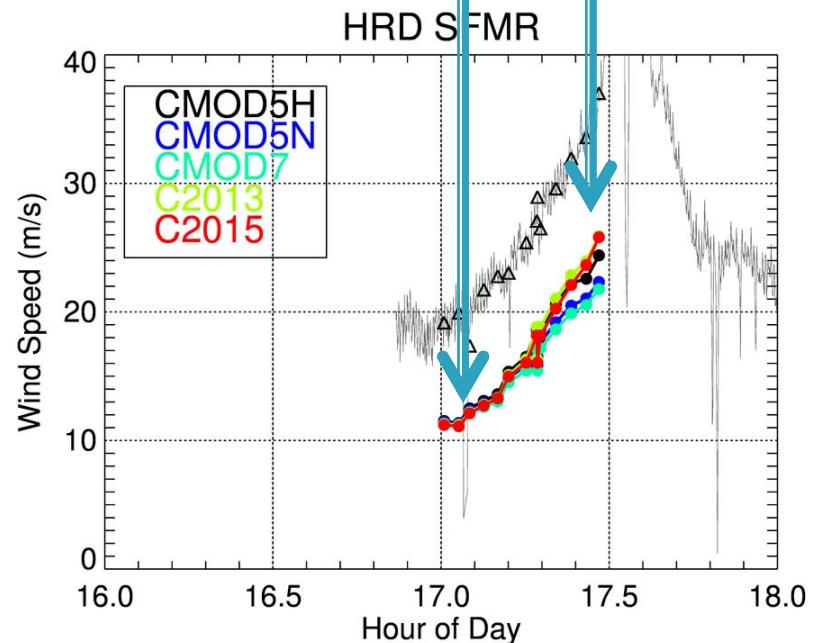
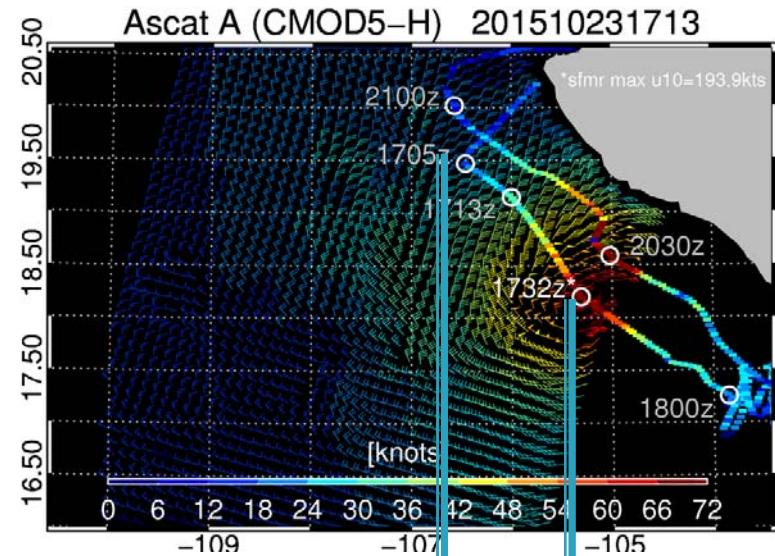
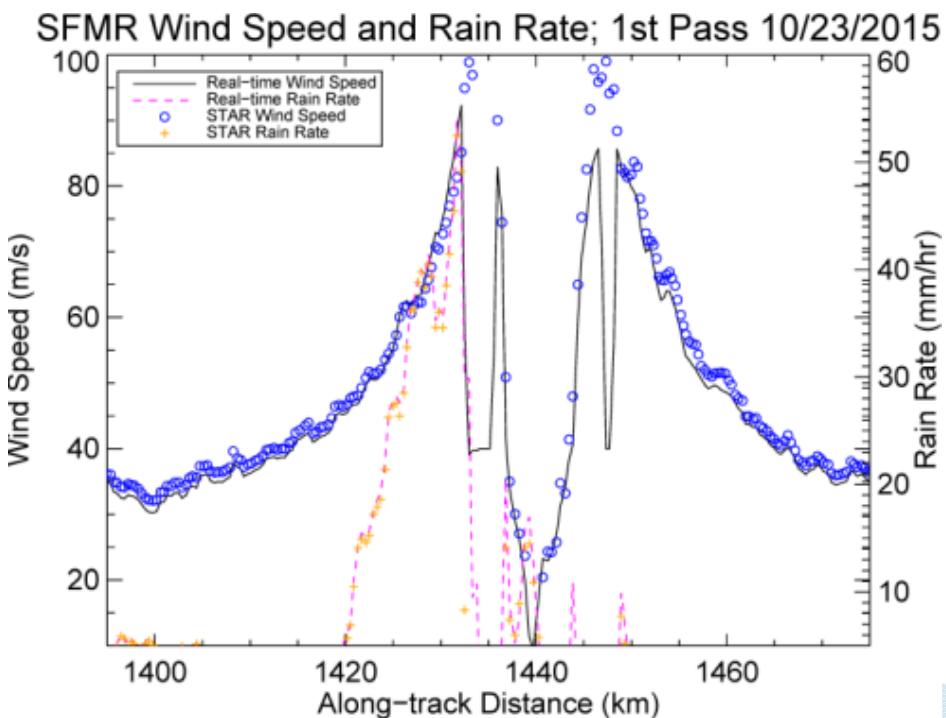




ASCAT Observations of Hurricane Patricia

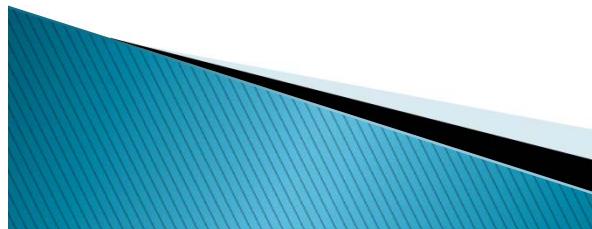
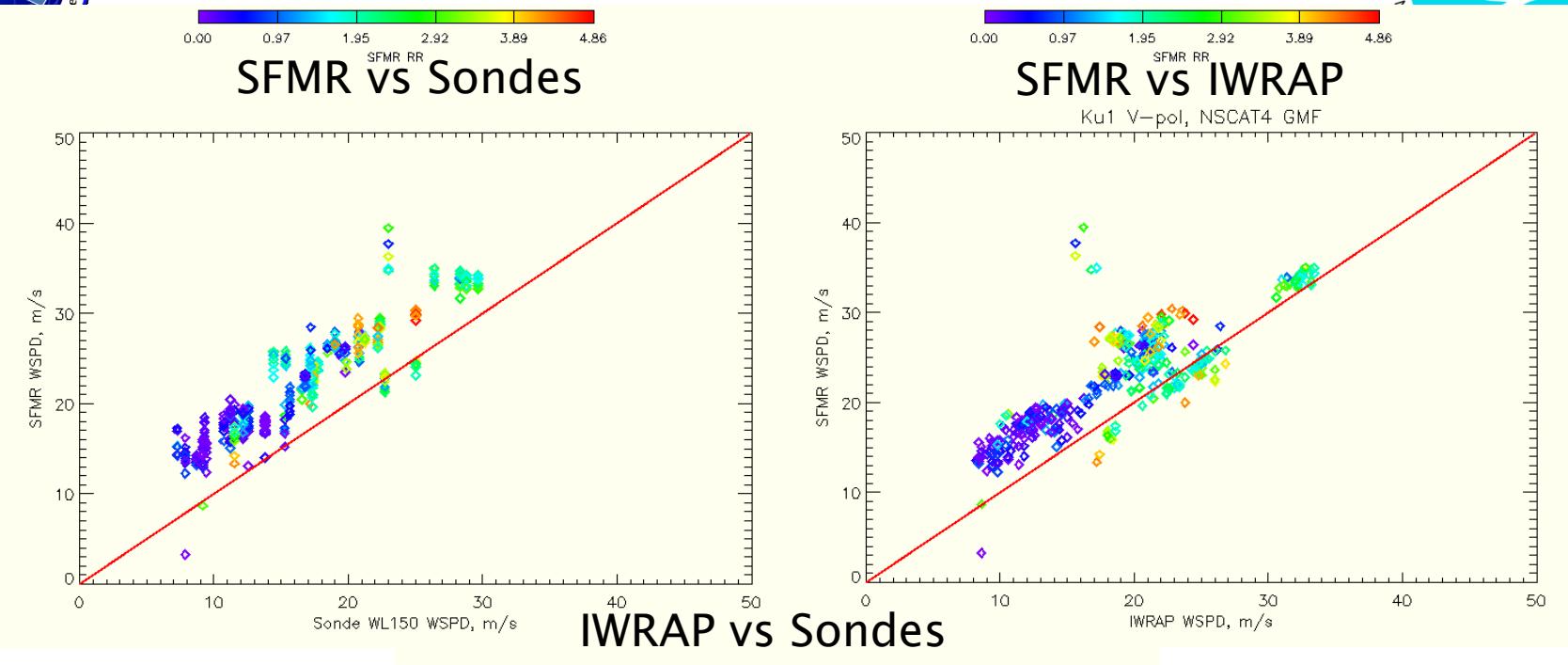
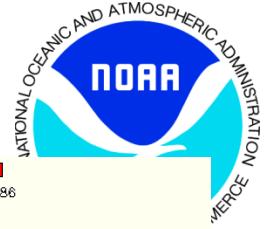


- ▶ ASCAT pass over Hurricane Patricia 23rd Oct 2015 17:14Z
- ▶ NOAA P3 SMFR Winds within 25km and +/- 0.5h from ASCAT pass.
 - NOAA reprocessed SFMR data set
- ▶ ASCAT winds retrieved using KNMI ASCAT processor, 5 different GMF's and GFS nudging field





2015 NOAA P3 Winter Experiment SFMR Wind Evaluation

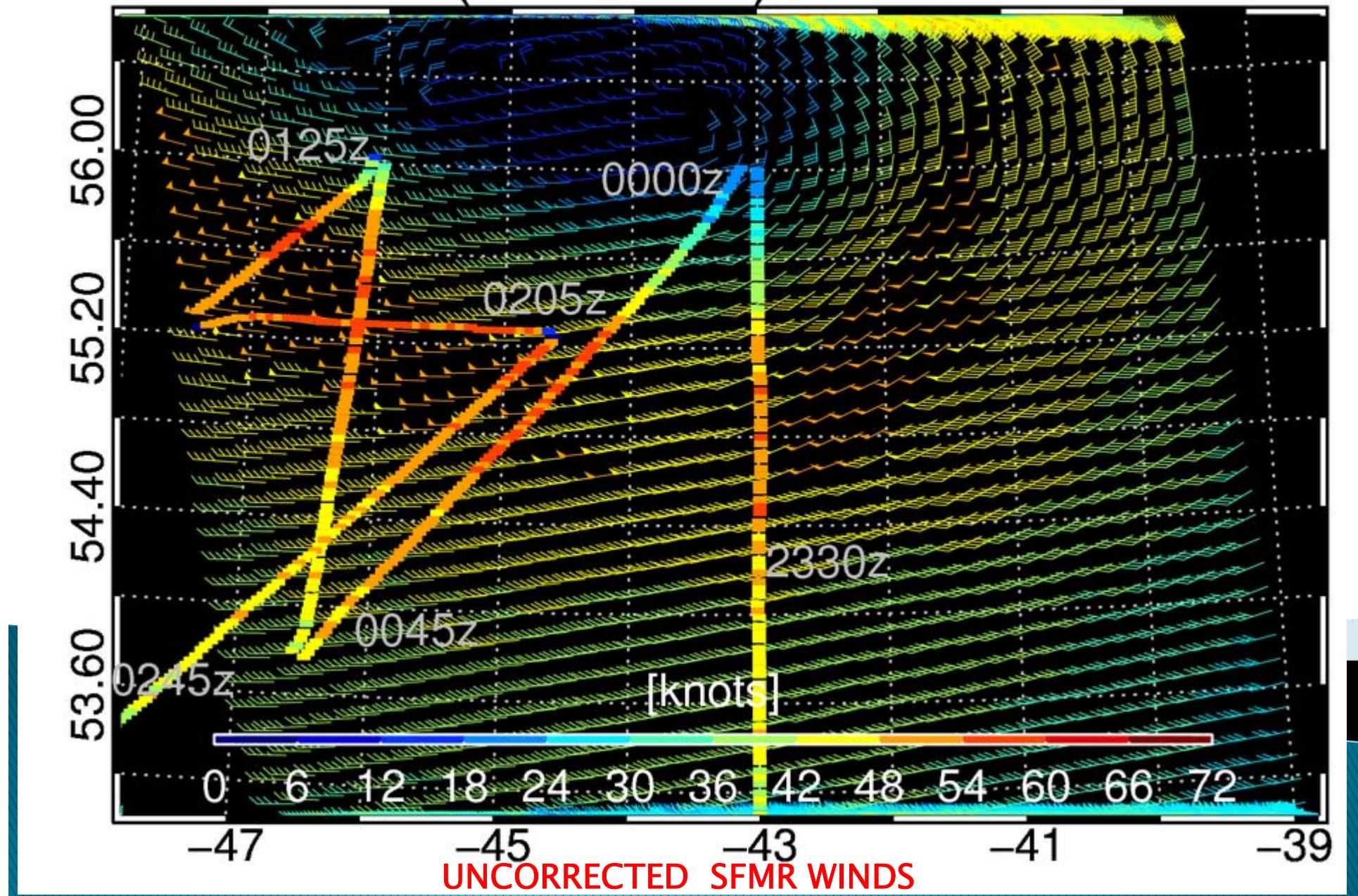


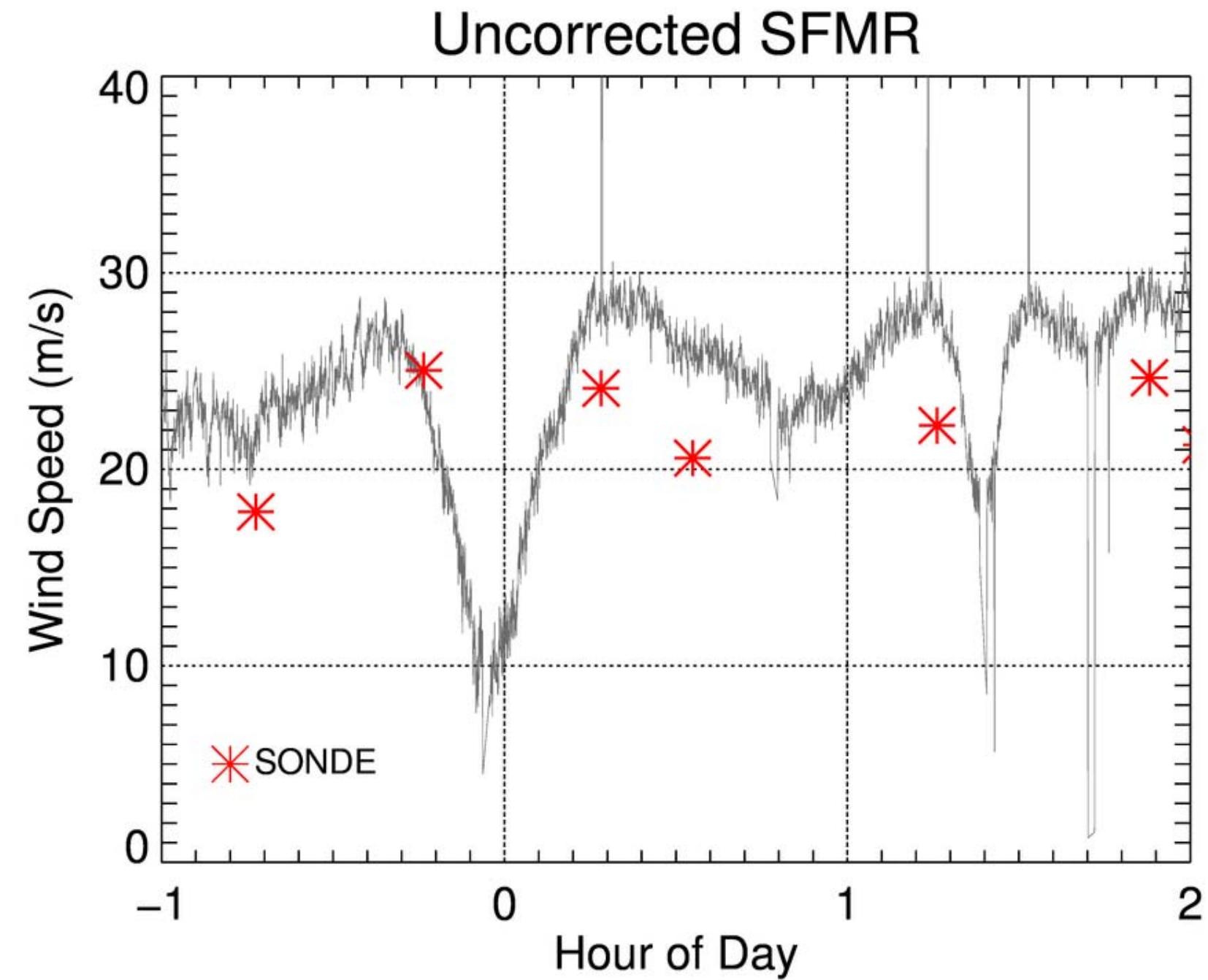


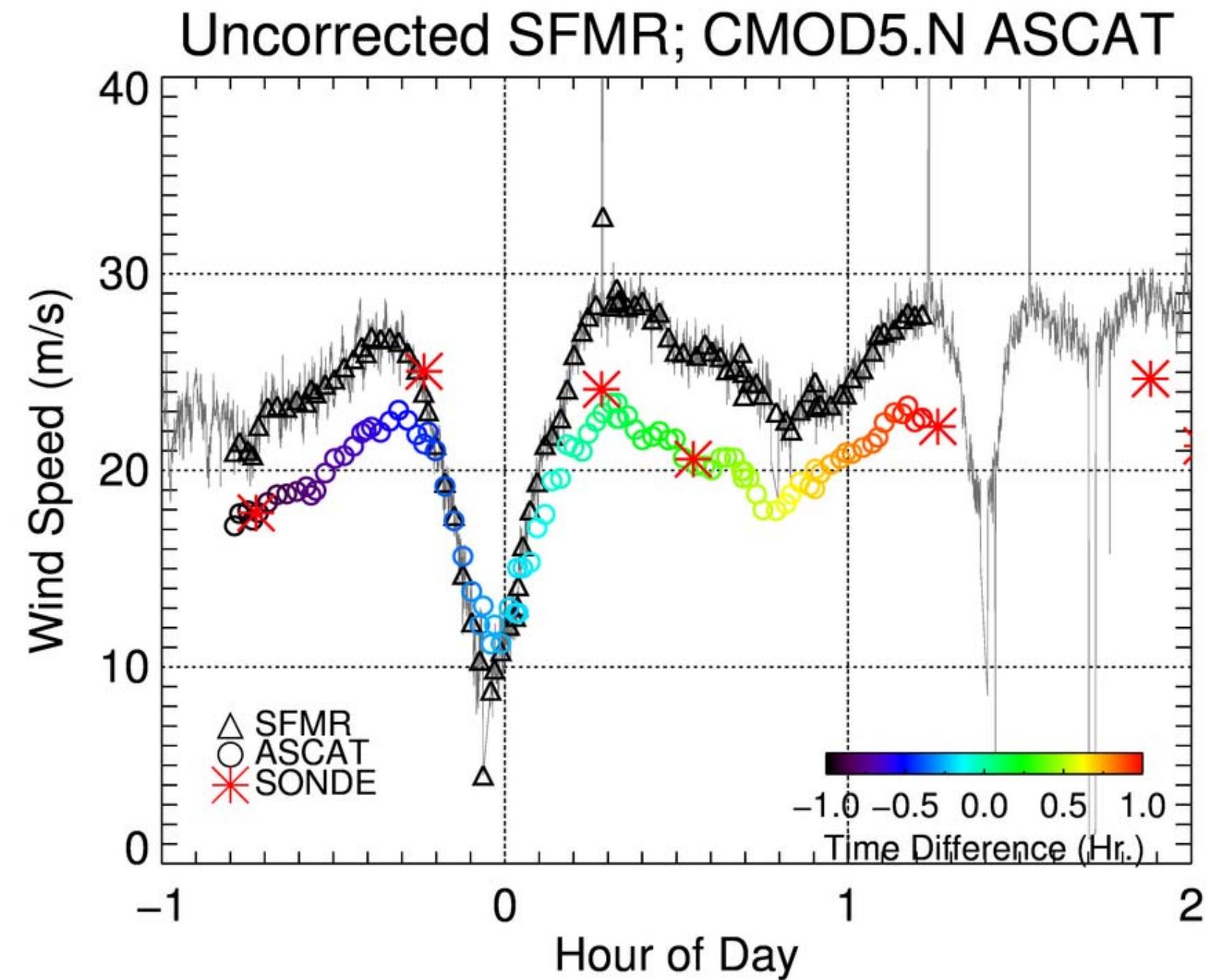
KNMI, NOAA and RSS ASCAT High Winds Case Study Extratropical Storm Feb 1st, 2010 NOAA P3 Flight

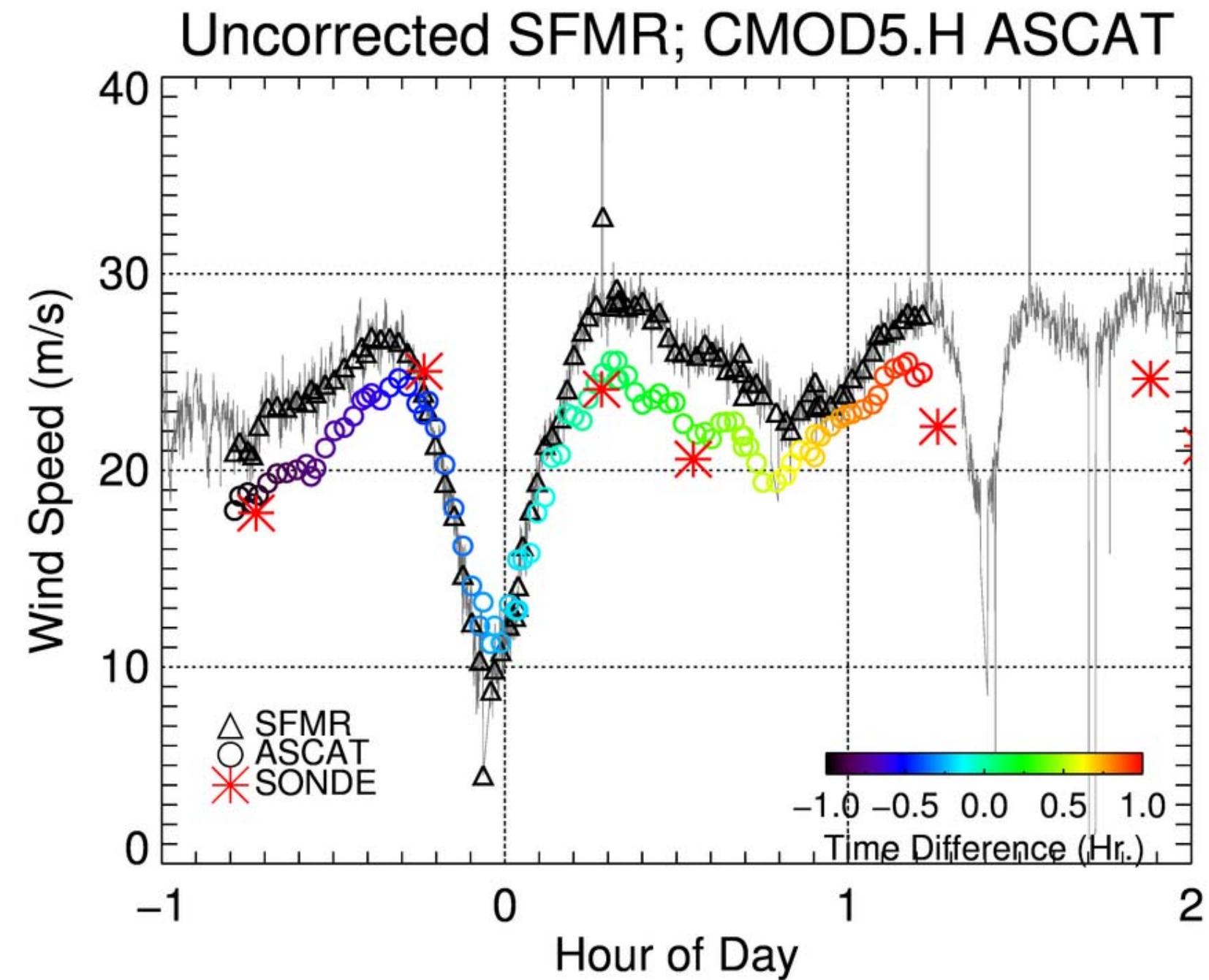


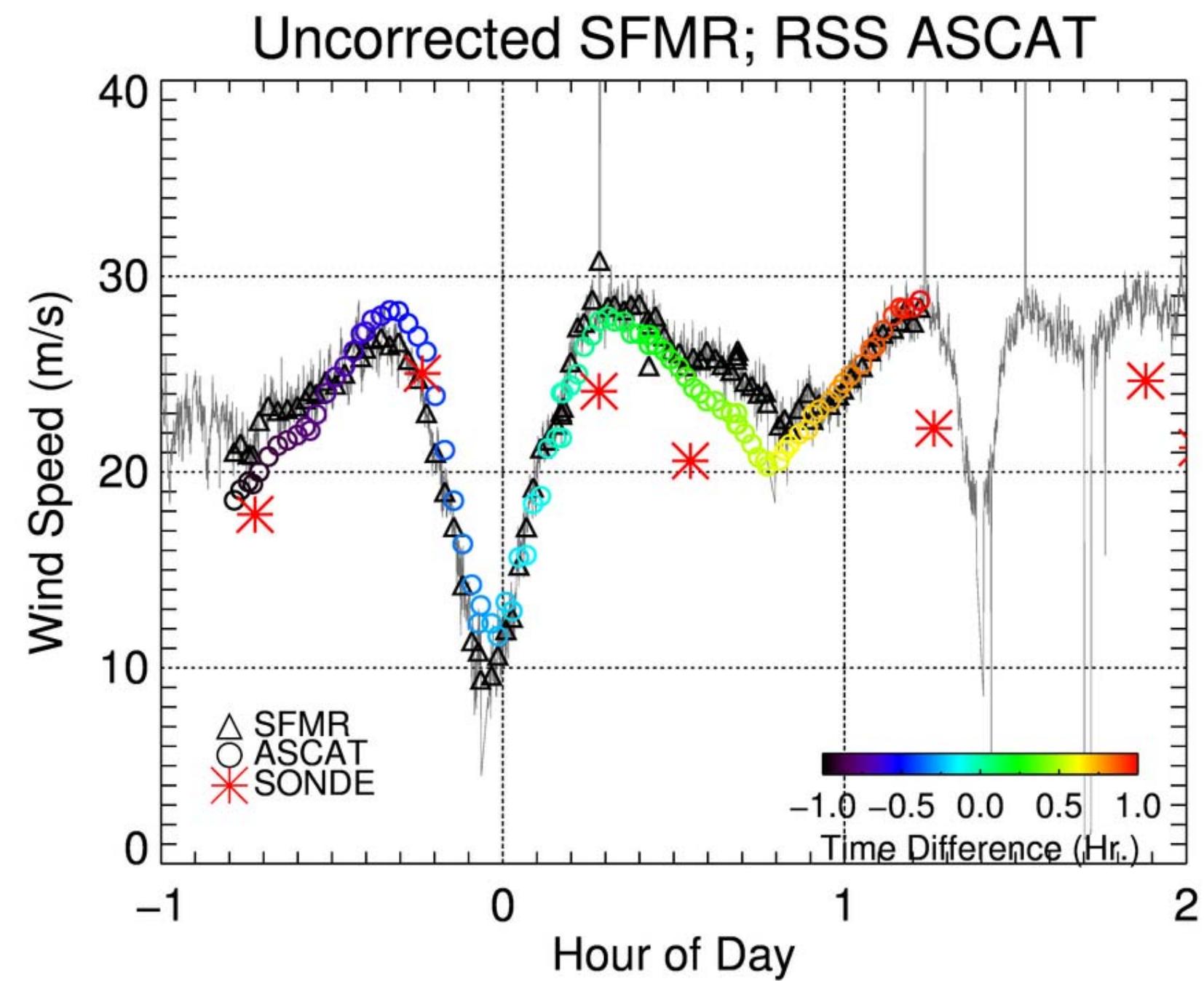
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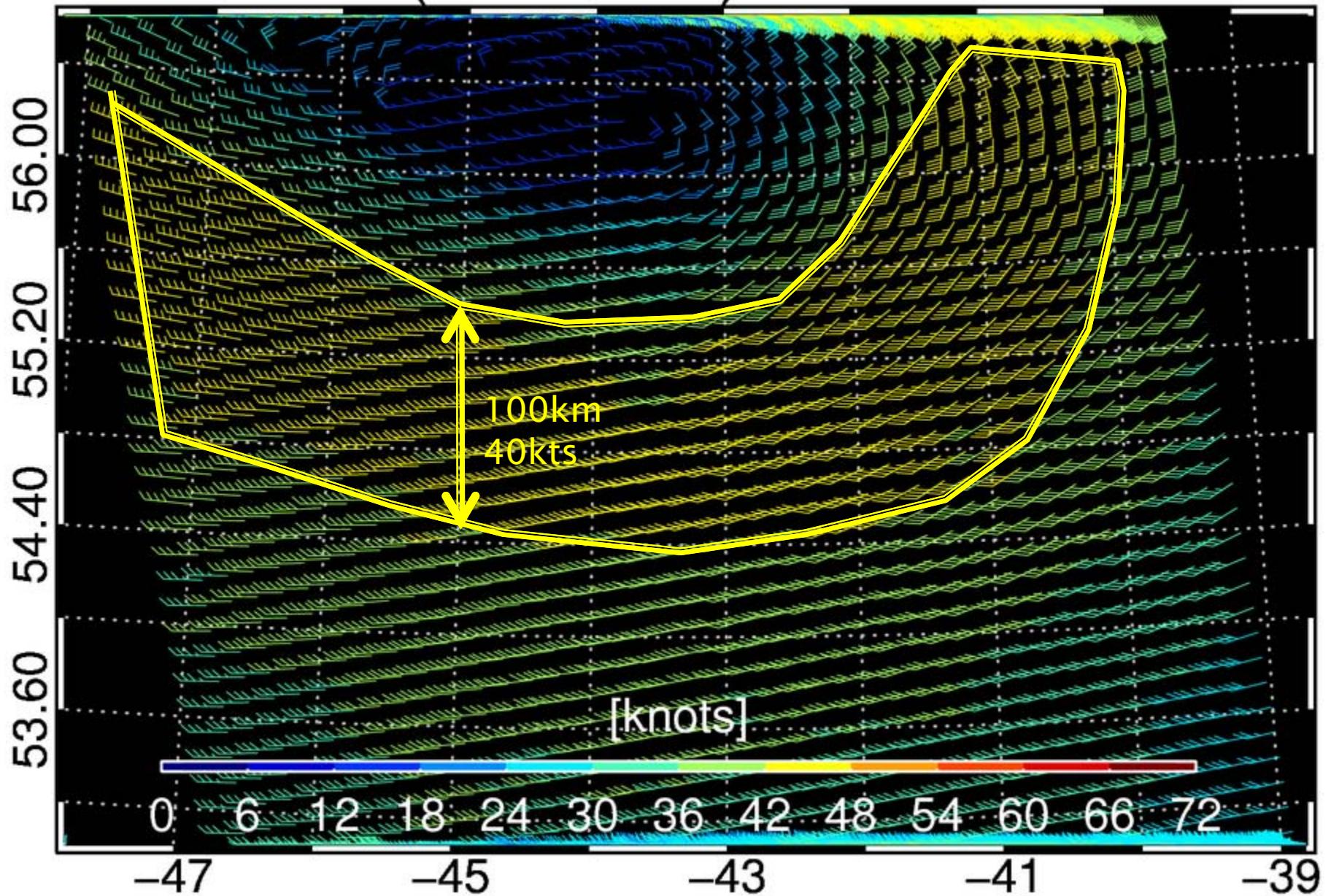




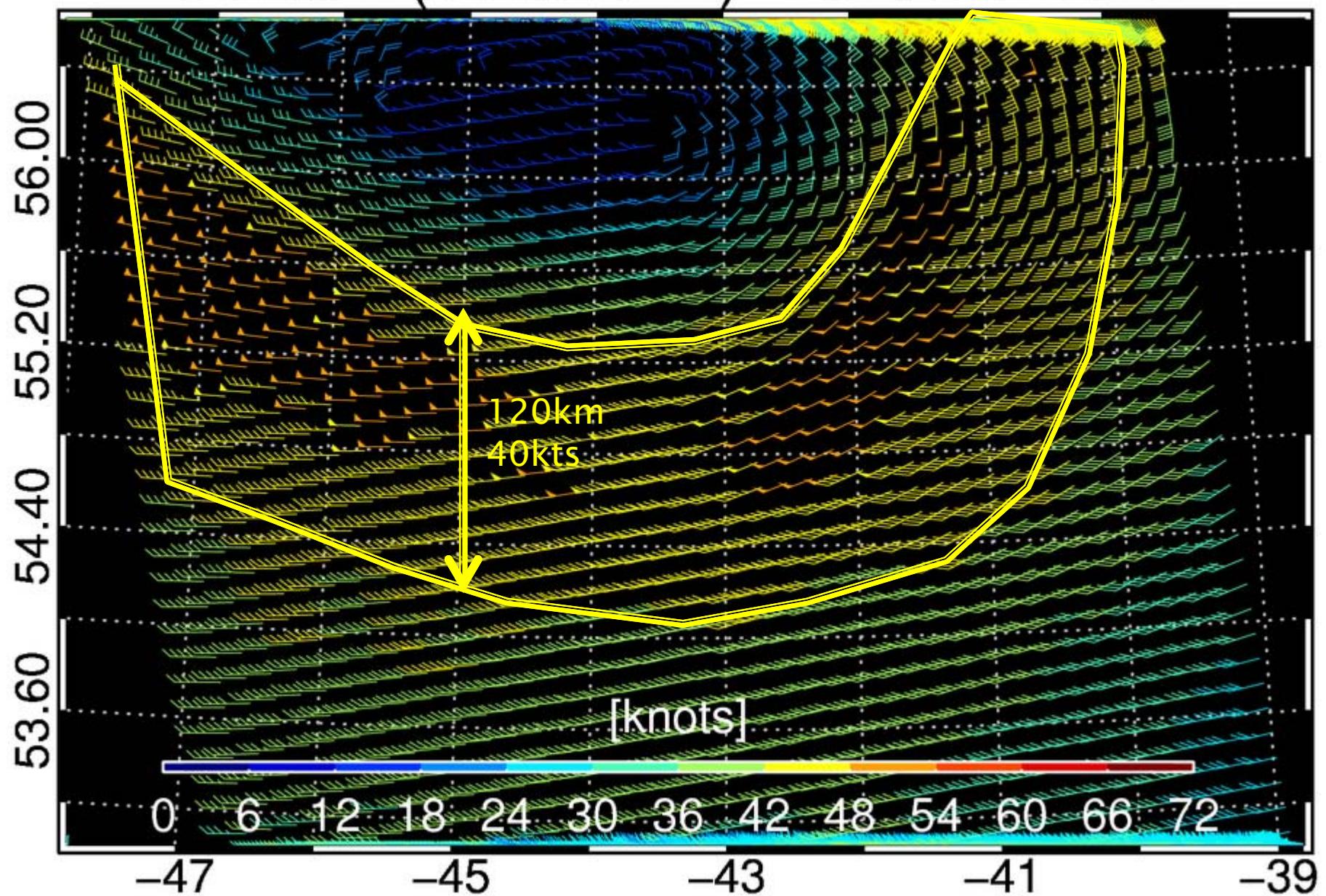




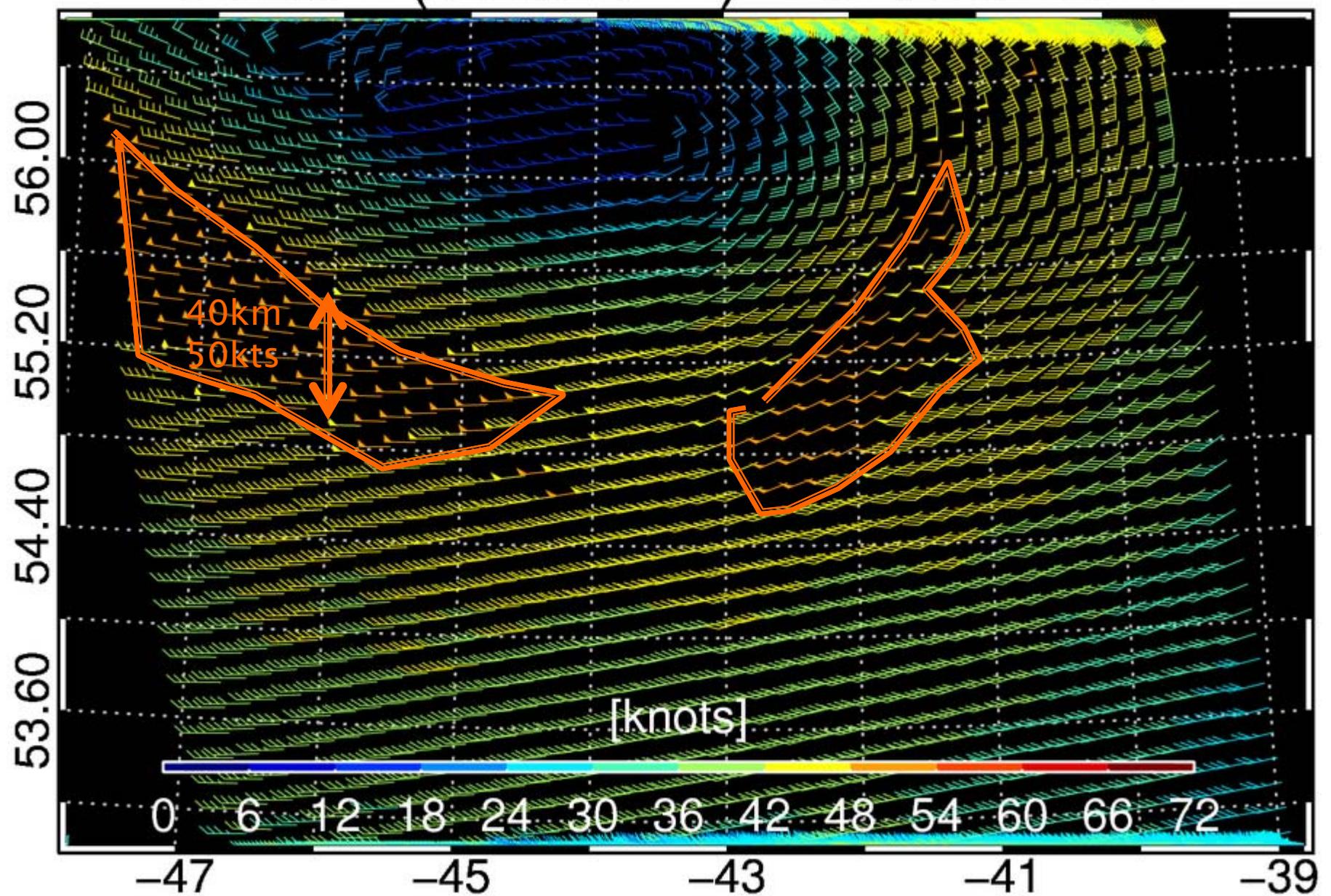
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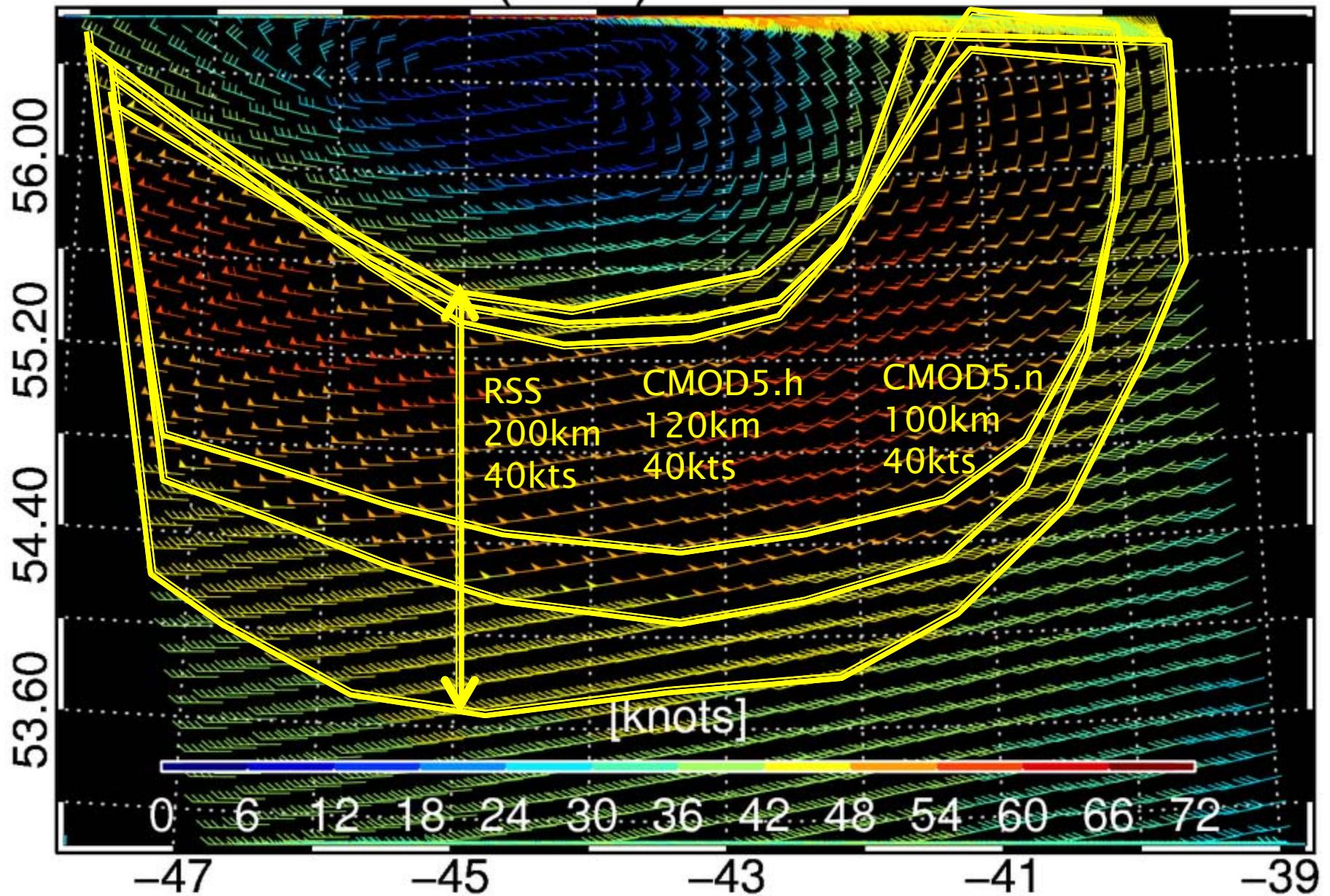
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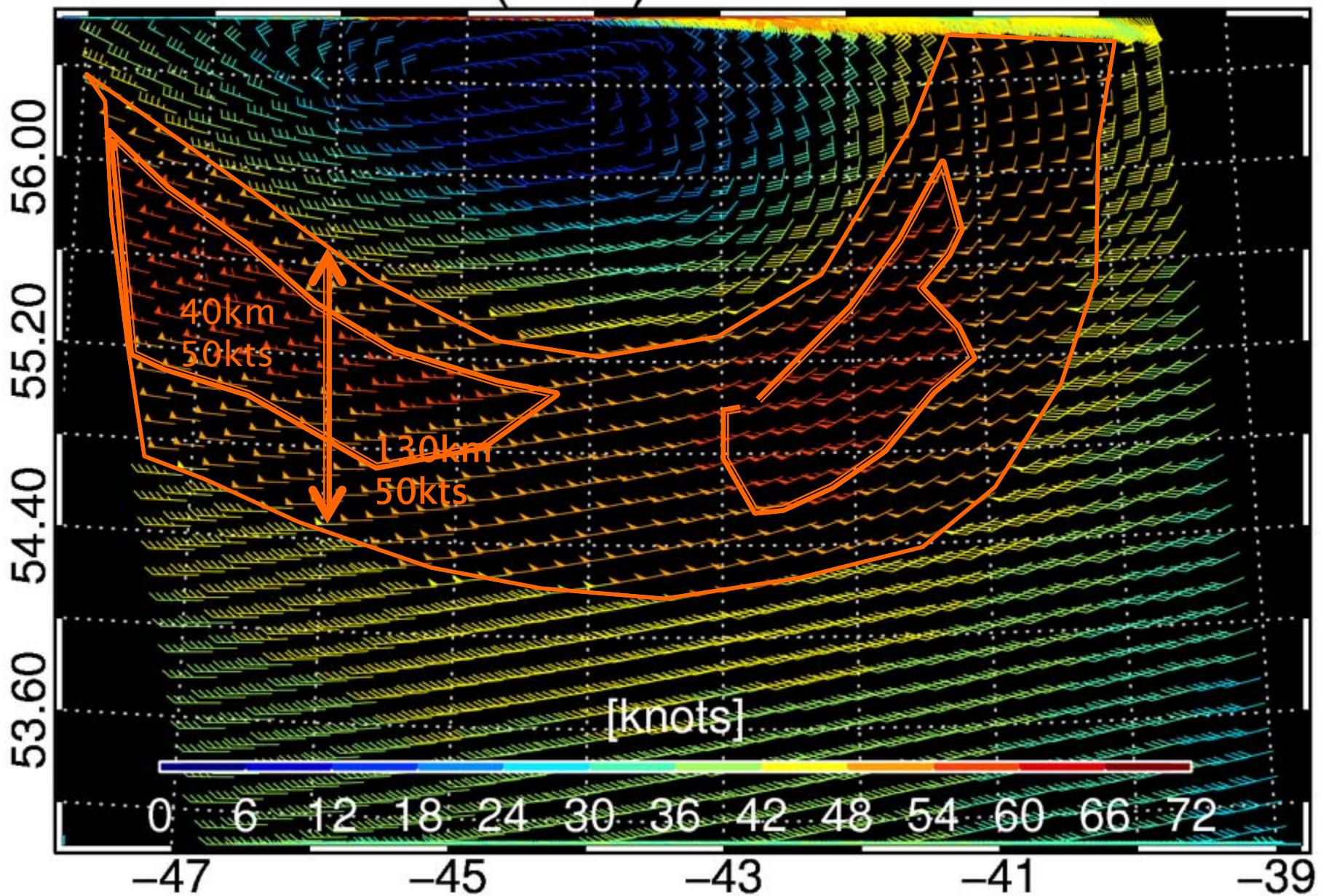
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Ascat A (RSS) 201002020012



Ascat A (RSS) 201002020012





Conclusions

- ▶ Radiometer and scatterometer constellation allows for frequent wind and rain field observations of storms that underwent extratropical transitions. While current constellation allow us to see changes within an hour there are still 6–10h gaps when we don't have any measurements
- ▶ RSS radiometer and scatterometer climatological data set ideally suited to study wind field however high winds in extratropical cyclones might be overestimated
- ▶ Changes in wind field observed within 1h
 - For sensor to sensor validation purposes time collocations should be limited to maximum 1h
 - Difference in model function results not just in differences in maximum wind but radius of high winds
 - Climatology of high wind events and storm structures is impacted based on which wind product is used