High Wind Observations within Extratropical Cyclones from Radiometers and Scatterometer

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SFMR Data Reprocessing (Joe Sapp Poster)

- Data reprocessed for hurricane seasons 2006-2016 (except 2007)
 - Recalibrated Tb's
 - Changes in surface emissivity model for winds and sst (<15C)
 - Rain estimation from channel variance
 - Change in atmospheric model for Ta<5
- Winter data still work in progress
 - Correction for t5-Ta>5C
- Sonde data reprocessed since 2006
 - Utilizing NHC WL150 conversion to surface winds
- For data access email Zorana or Paul





Wind Field Structure Observations within Mature ETC's

- Satellite observations of extratropical cyclone
 - QuikSCAT: KNMI, JPL and RSS
 - ASCAT-A: KNMI, NOAA and RSS
 - SMAP JPL and RSS
 - RSS Radiometer wind products: SSMIF16, SSMIf17,WindSat, AMSR-E, GMI, AMSR-2



Extratropical Storm Life Cycles (adapted from Shapiro – Keyser Cyclone Model)



QuikSCAT Products Comparison 2001-2009





ASCAT-A Products Comparison 2007-2015





SMAP Winds Within Extratropical Cyclones

- RSS SMAP winds
- JPL SMAP winds
 - Global wind product
 - High wind product
 - High wind product salinity qc applied



SMAP Wind Products Comparison 20015-2017



North: 0. 22 deg

Image size: 50x50 deg Grid size: 0.25x0.25 deg

0170 best track cases

0408 best track case

Image size: 50x50 deg Grid size: 0.25x0.25 deg

Image size: 50x50 deg Grid size: 0.25x0.25 deg

0185 best track cases



North Atlantic Extratropical Storm NOAA Aircraft Observations, February 6th, 2017 MENT OF PASS @ 2017 Feb 06-0803z-SMAPJPL ASS @ 2017 Feb 06-0803z-SMAPJPL HIGHWIND PASS @2017 Feb 06-0804z--SMAP RSS 8 SMAP wind [knots] (max wspd: 62. knots ax wspd: SFMR max u10=73.3kts *SFMR max u10=73.3kts *SFMR max u10=73.3kts eco and a construction of the second 9 1050z* Q Q 050z* 050720000000 00000000 06z 06z 057 05z06z 05z 2 07z 07z -32 -32 -16 -32 -24-16-24 -24-16 [knots] [knots] [knots] 24 30 42 48 54 60 66 42 48 54 60 66 72 54 60 12 18 36 72 6 12 18 24 30 36 6 12 18 24 30 36 42 48 66 PASS @2017 Feb 06-1148z--ASCAT-B NOAA PASS @2017 Feb 06-0853z--WINDSAT 8 8 56 56 050z* 0804z 22 22

-32 -24 -16 [knots] 0 6 12 18 24 30 36 42 48 54 60 66 72

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SFMR Timeseries Feb 6th, 2017 Flight



Summary

- Difference in surface composites within extratropical cyclone can be attributed to different retrieval algorithm schemes, different gmf, different background filed used for nudging, different quality control scheme
 - RSS Scatterometer products when compared to other scatterometer products are producing stronger and specially larger wind fields on average in both North Atlantic and North Pacific storms
 - Two products from SMAP measurements produce highest winds within mature extratropical cyclones than any other wind product that we have so far
- Development of high wind model function while talking into account sfmr and sonde data as a reference has to take into account aerial distribution of high wind speeds as well