

Using scatterometer-measured vector winds to study high-impact weather events



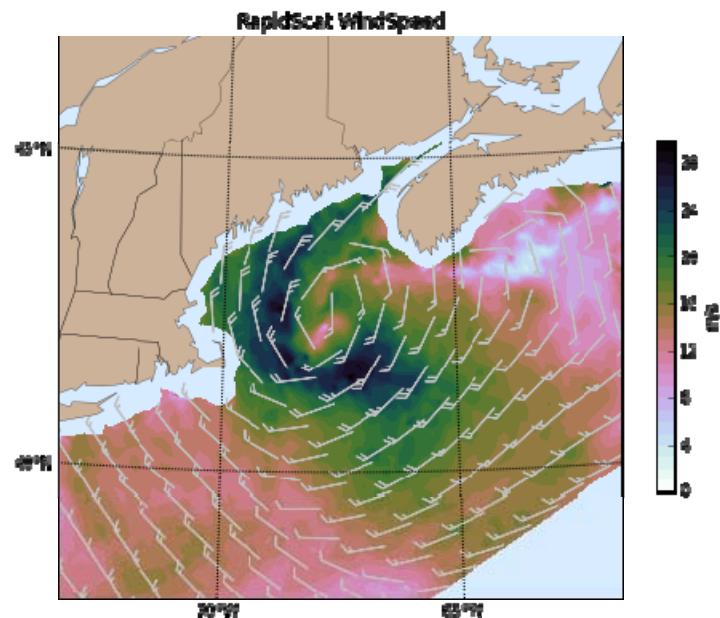
Timothy Lang



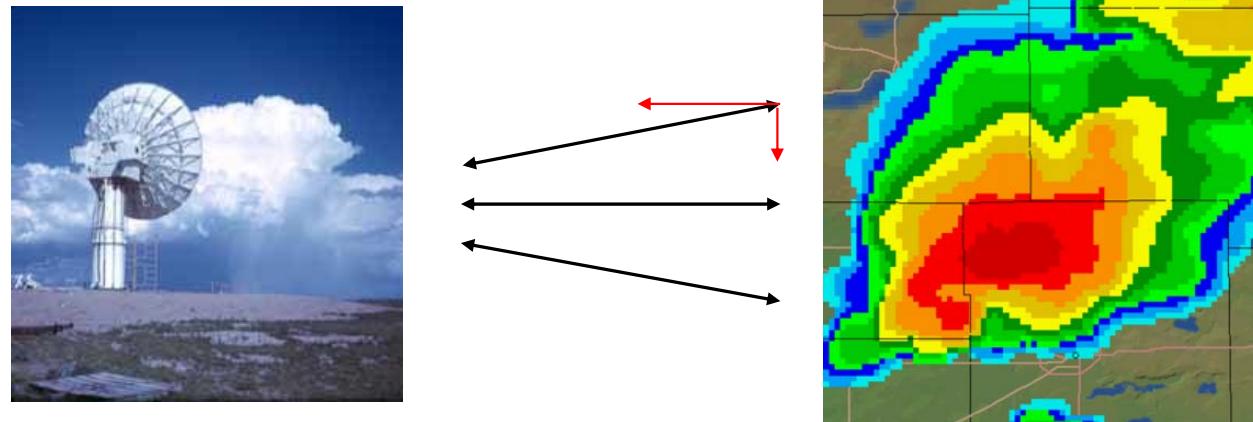
George Priftis, Themis Chronis



Steve Nesbitt, Piyush Garg, Stella Choi

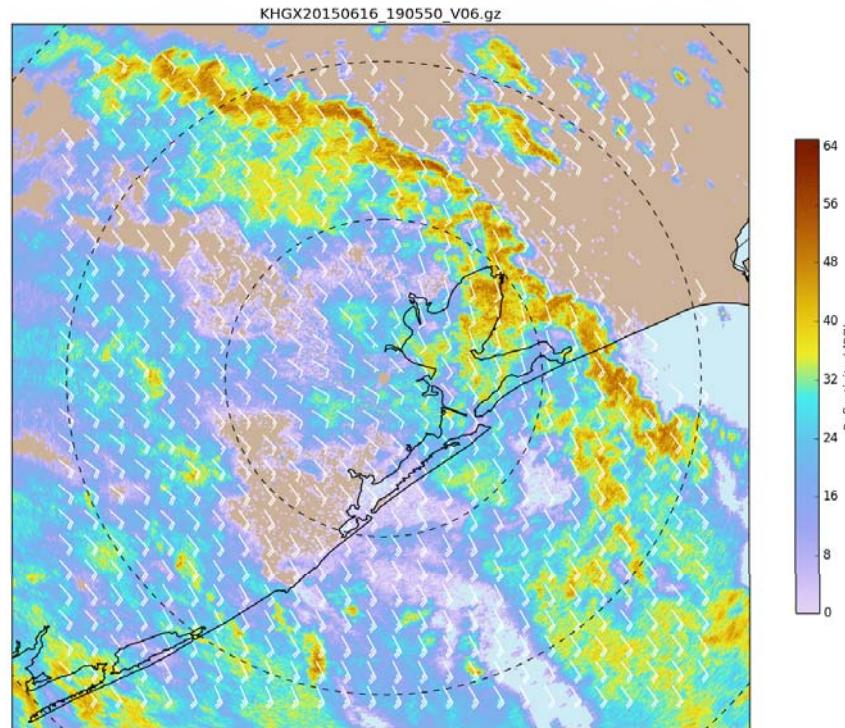


In this short update talk, we will examine the utility of comparing scatterometer overpasses with single-Doppler wind retrievals from coastal/island radars

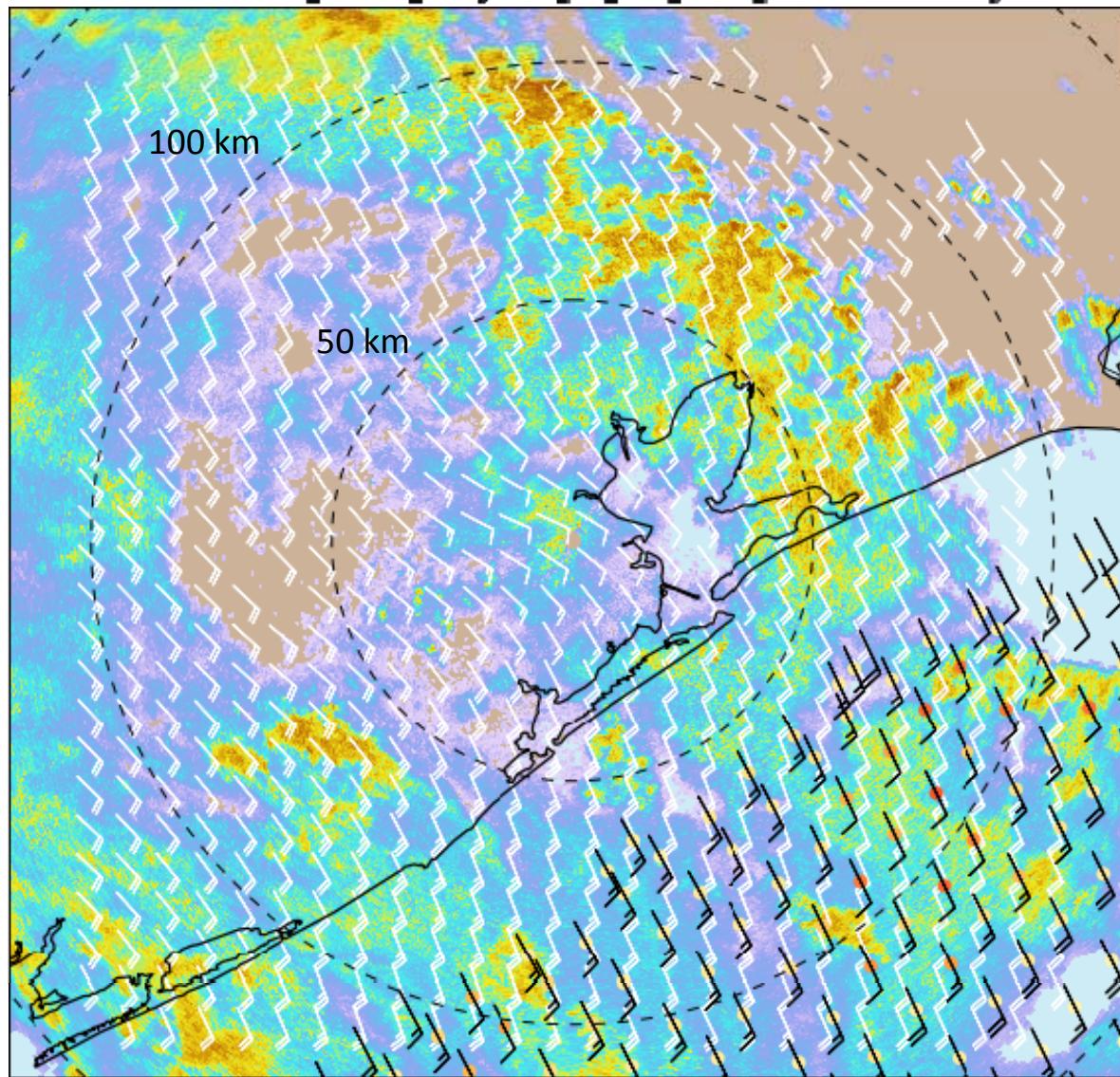


By using nearby azimuths to help estimate tangential wind, we can retrieve low-level 2D winds on the conical radar PPI “surface”

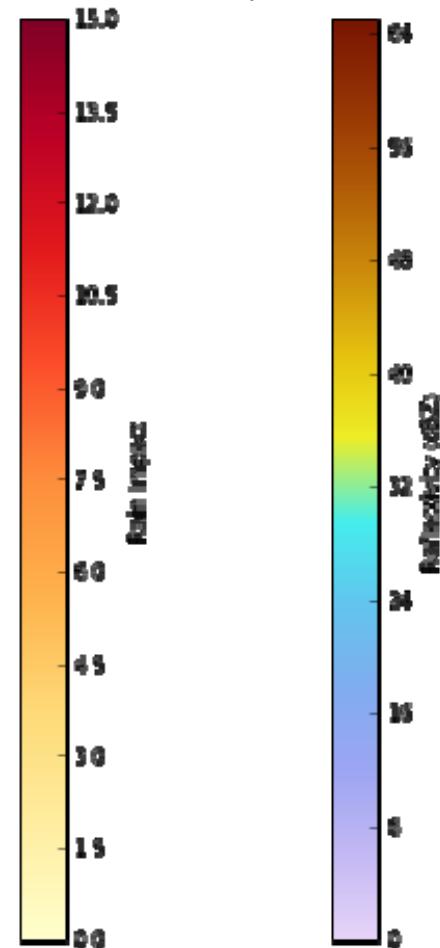
So how does this compare with a scatterometer?
Let's test this with a boring case to start.



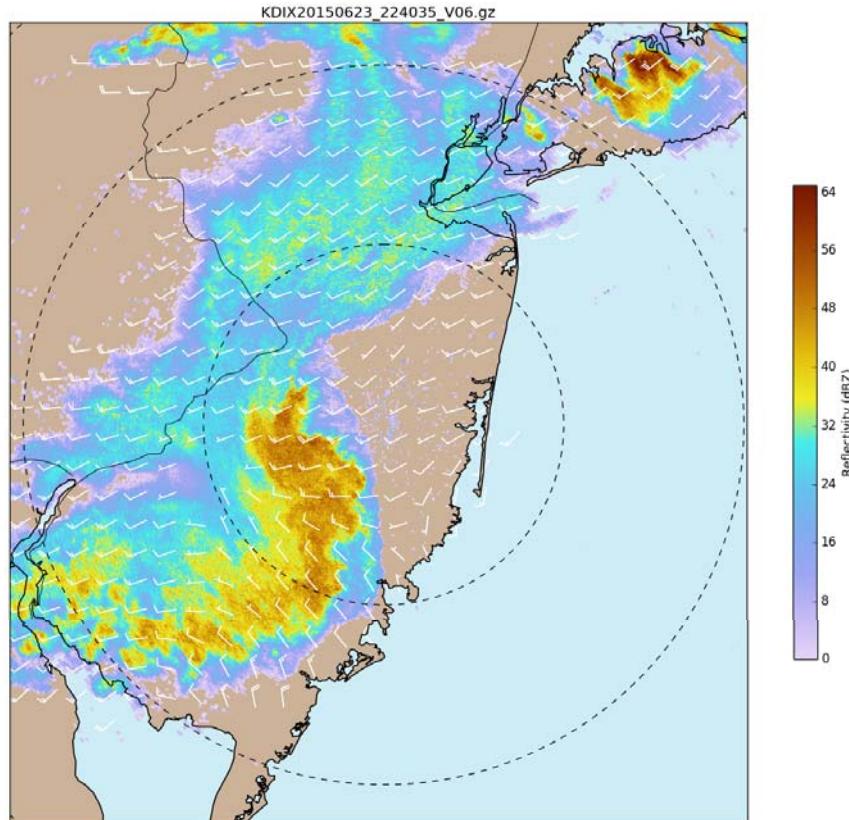
KHGX20150616_194258_V06.gz & m_J2b_vL1_04141_201506230125.nc.gz



SingleDop = White
RapidScat = Black

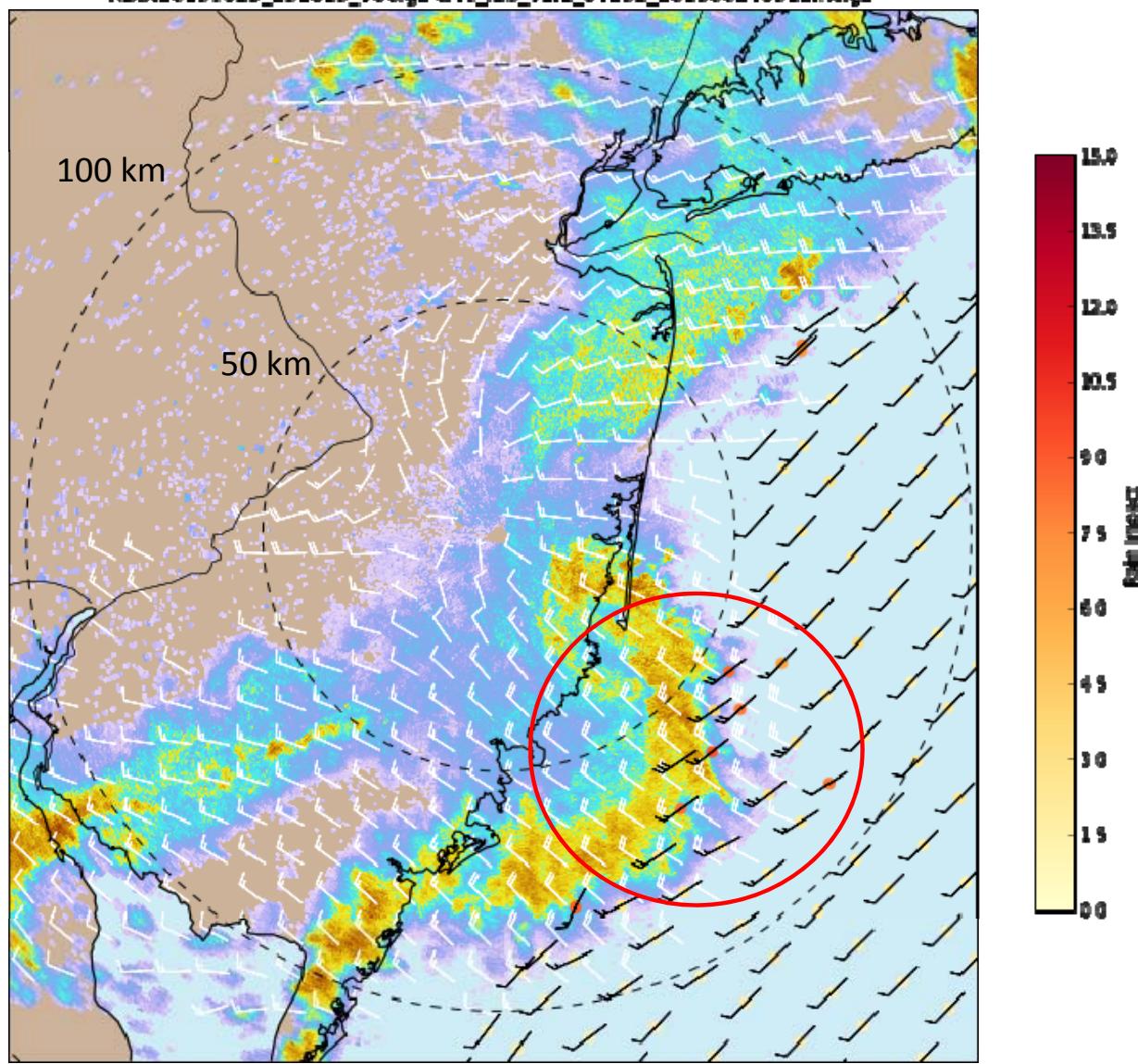


What about something a bit more dynamic?

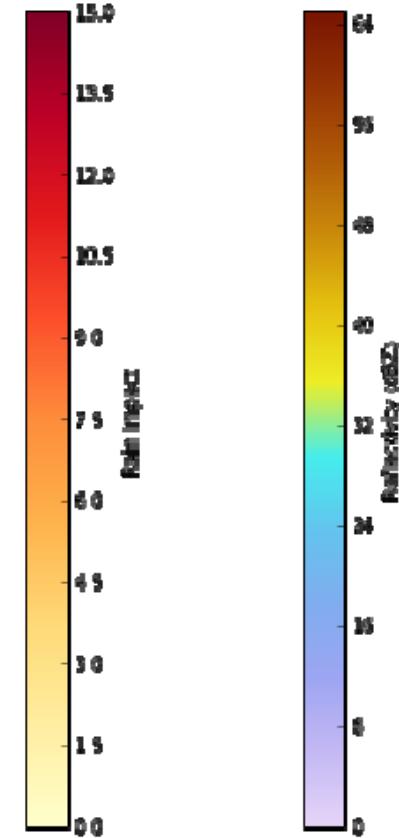


Offshore bow-echo system, anyone?

KDX20150623_231819_V06.gz & rs_J2b_v1.1_04292_201506240512.nc.gz



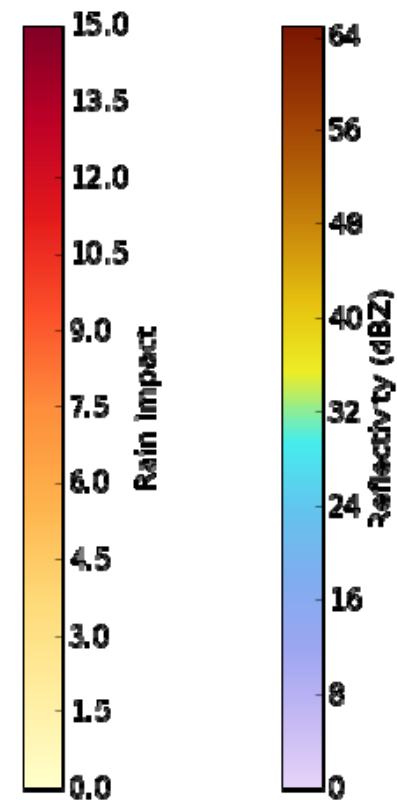
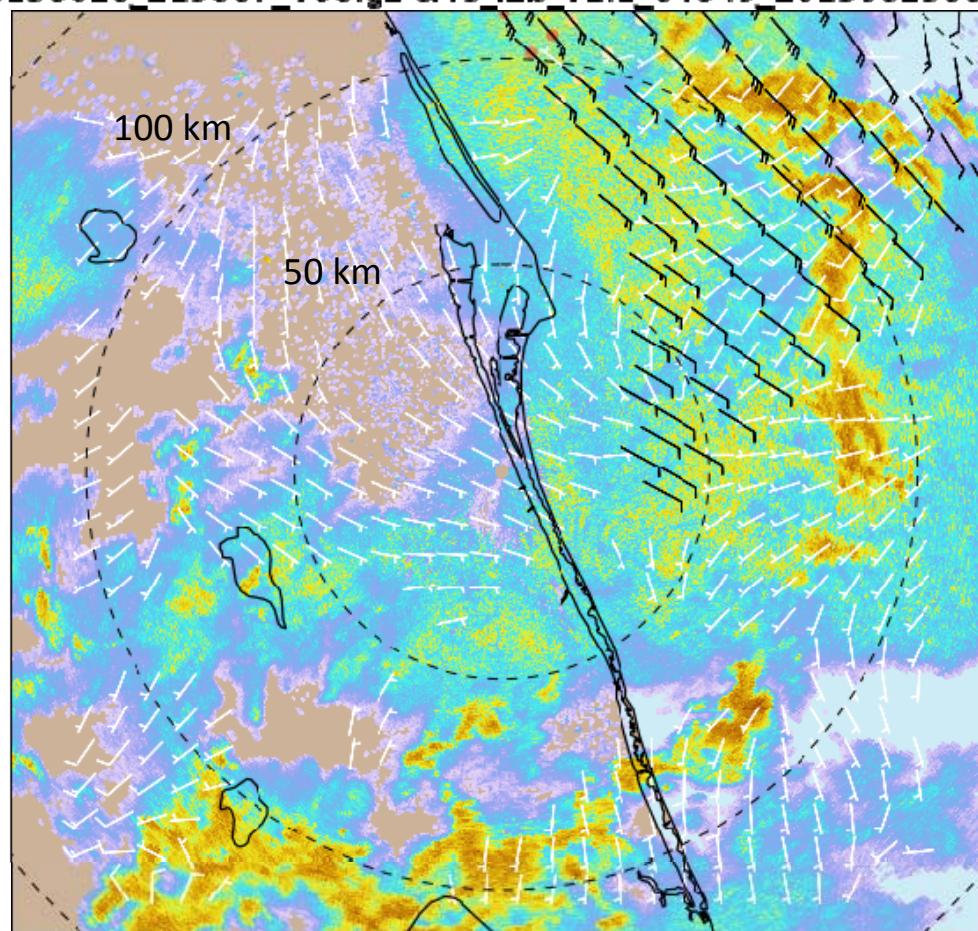
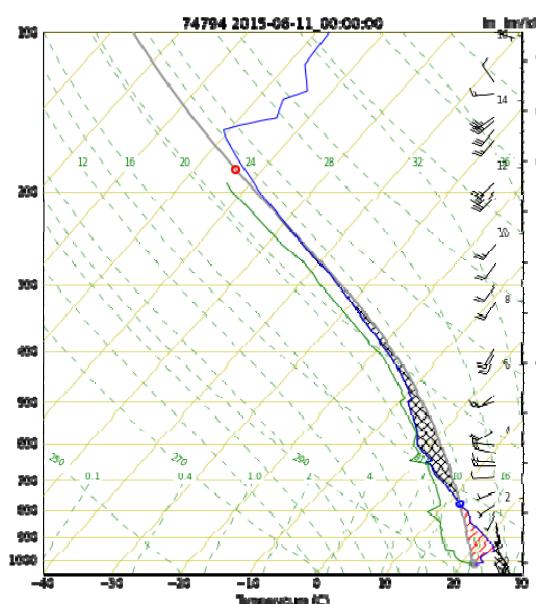
SingleDop = White
RapidScat = Black



SingleDop = White
RapidScat = Black

KMLB20150610_215007_V06.gz & rs_l2b_v1.1_04049_201506230020.nc.gz

Complementary
Information!





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Putting it all together

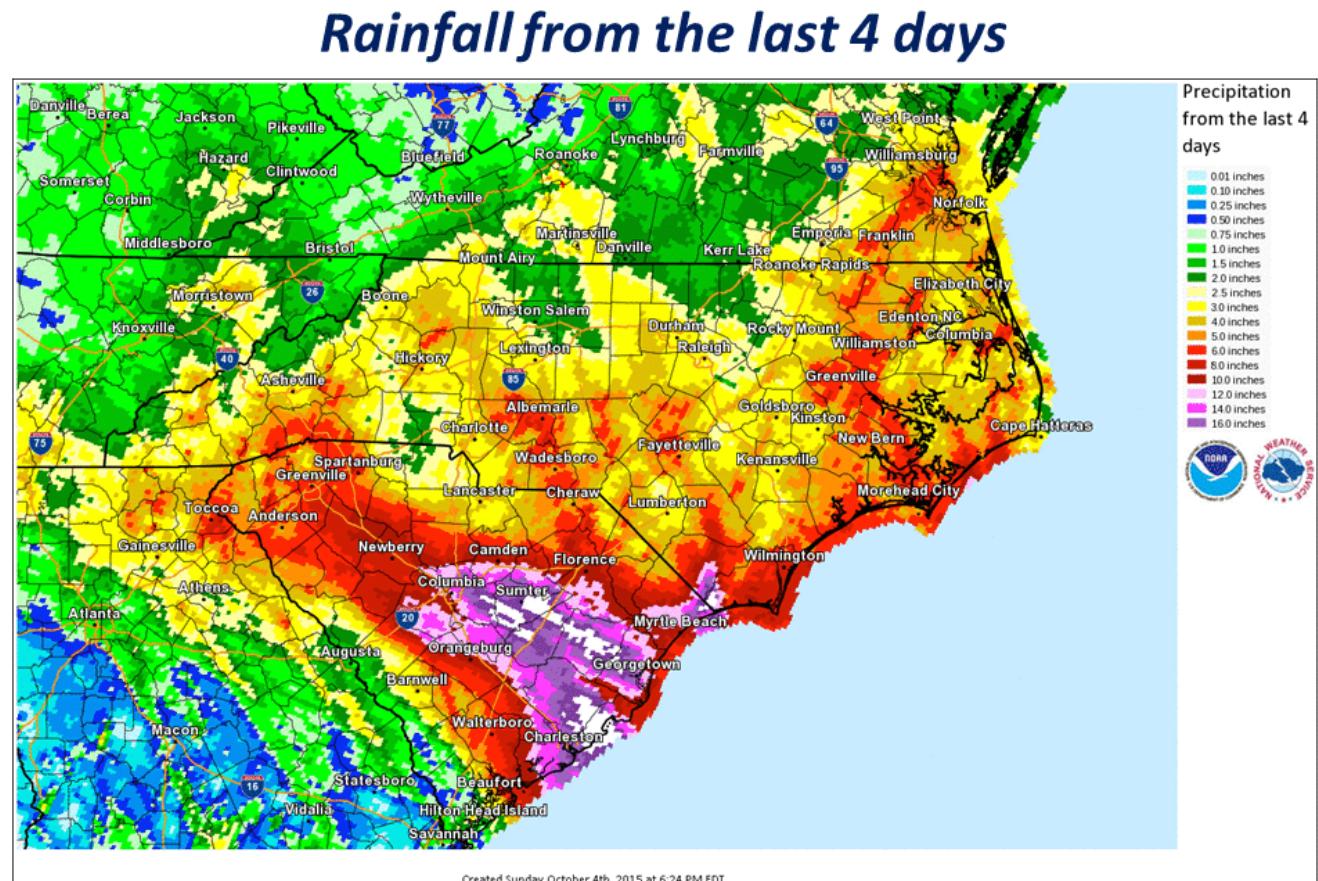
Let's take a brief look at last fall's South Carolina flood, from the offshore perspective.

Radars

KLTX (Wilmington) and KCLX (Charleston)

Scatterometers

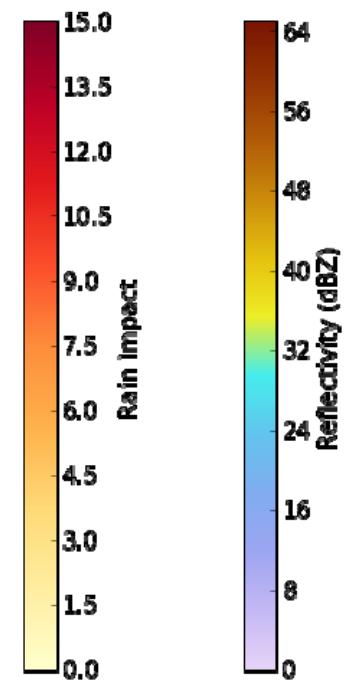
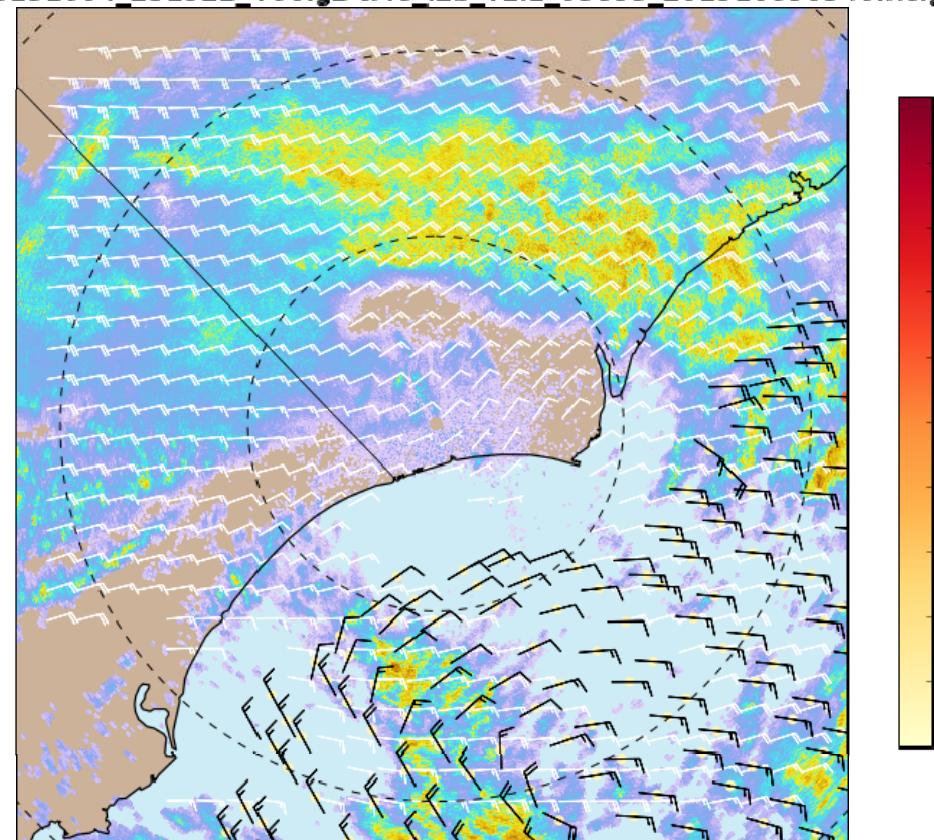
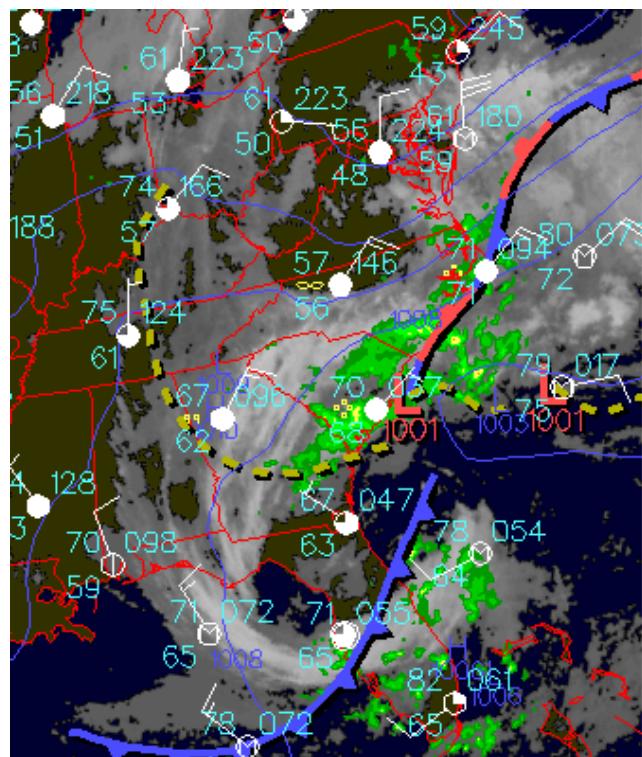
RapidScat, ASCAT-A, and ASCAT-B



SingleDop = White
RapidScat = Black

10/04/2015, 2319 UTC

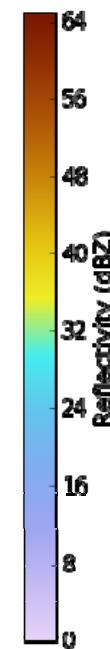
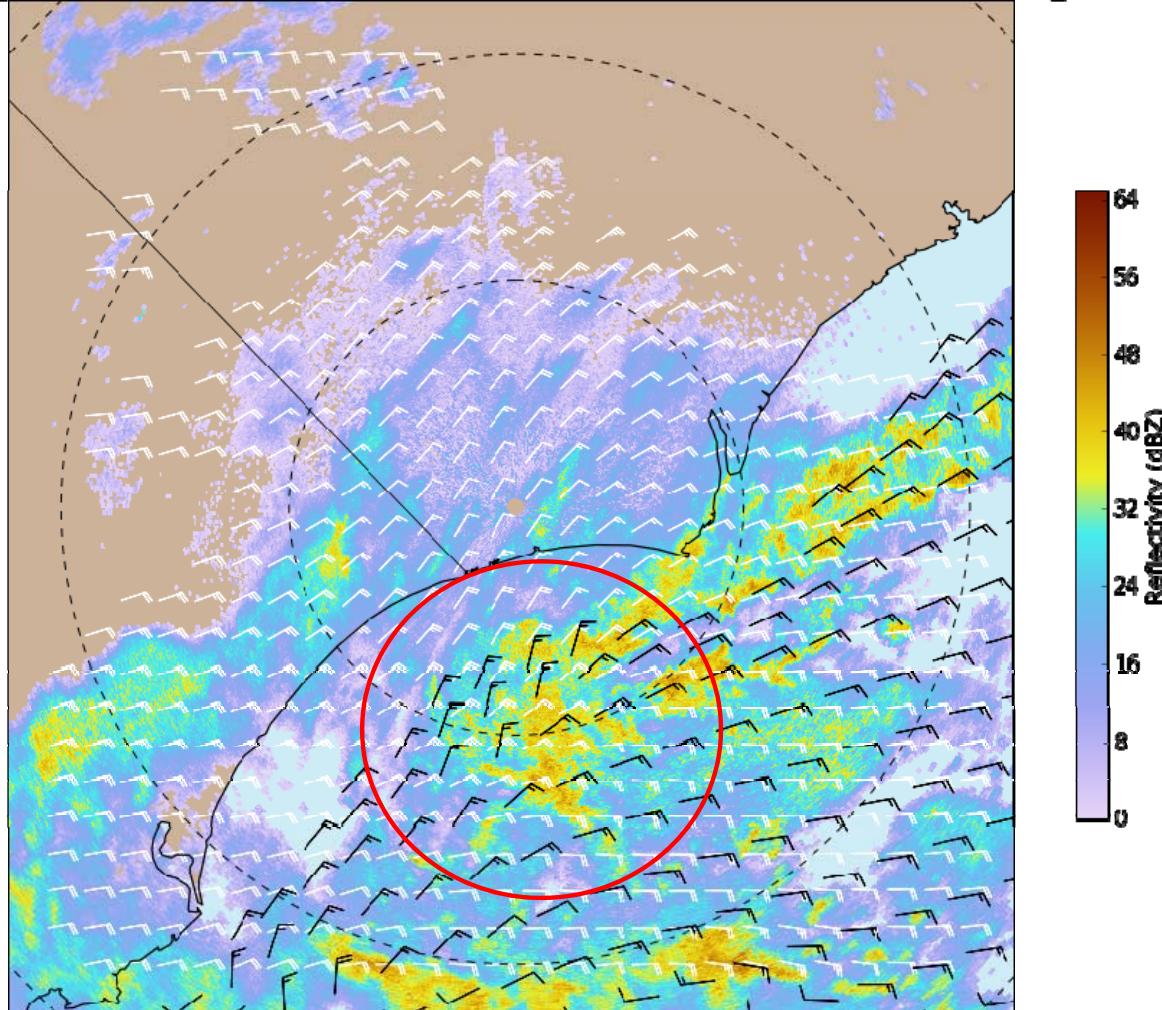
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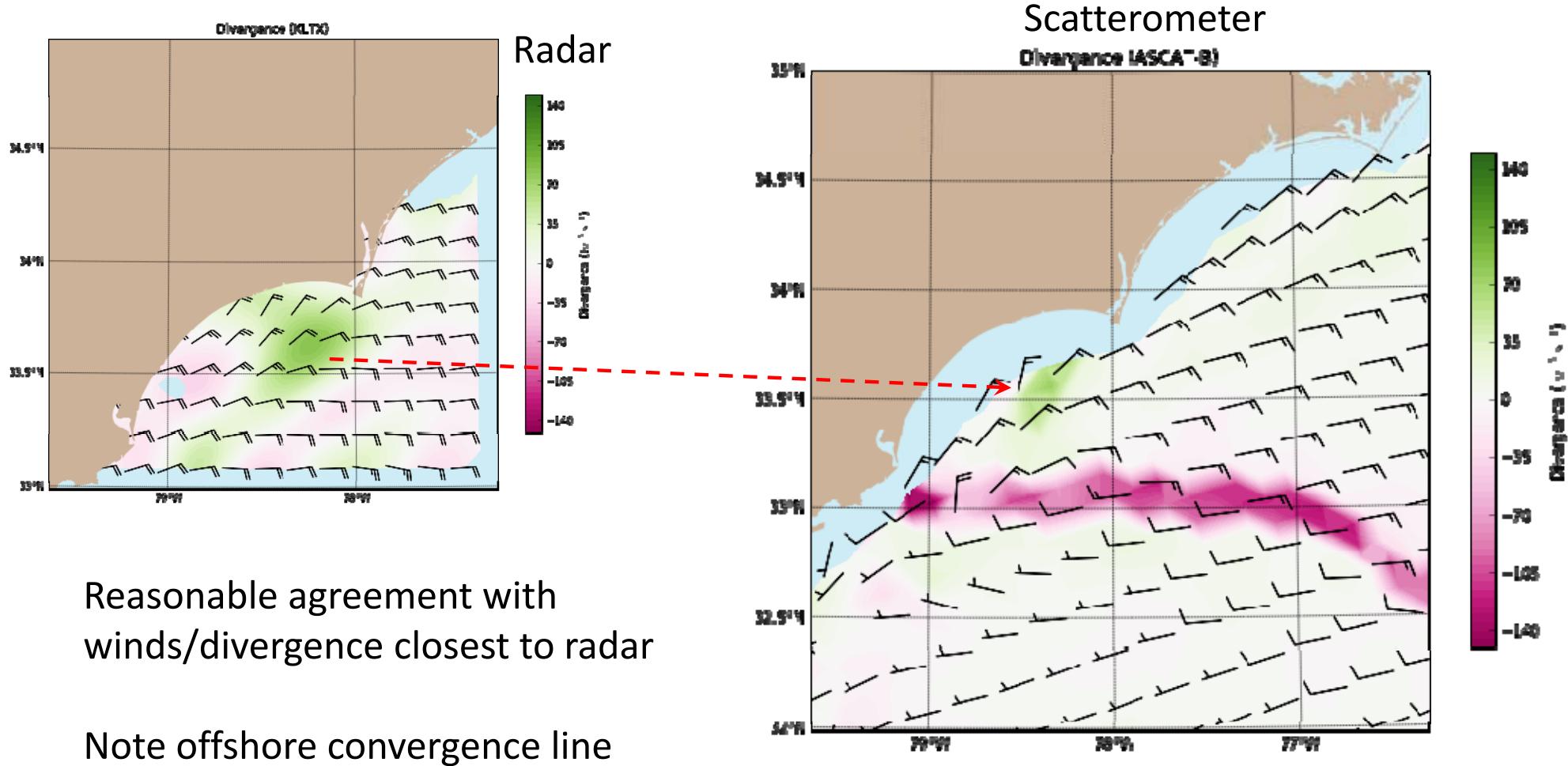


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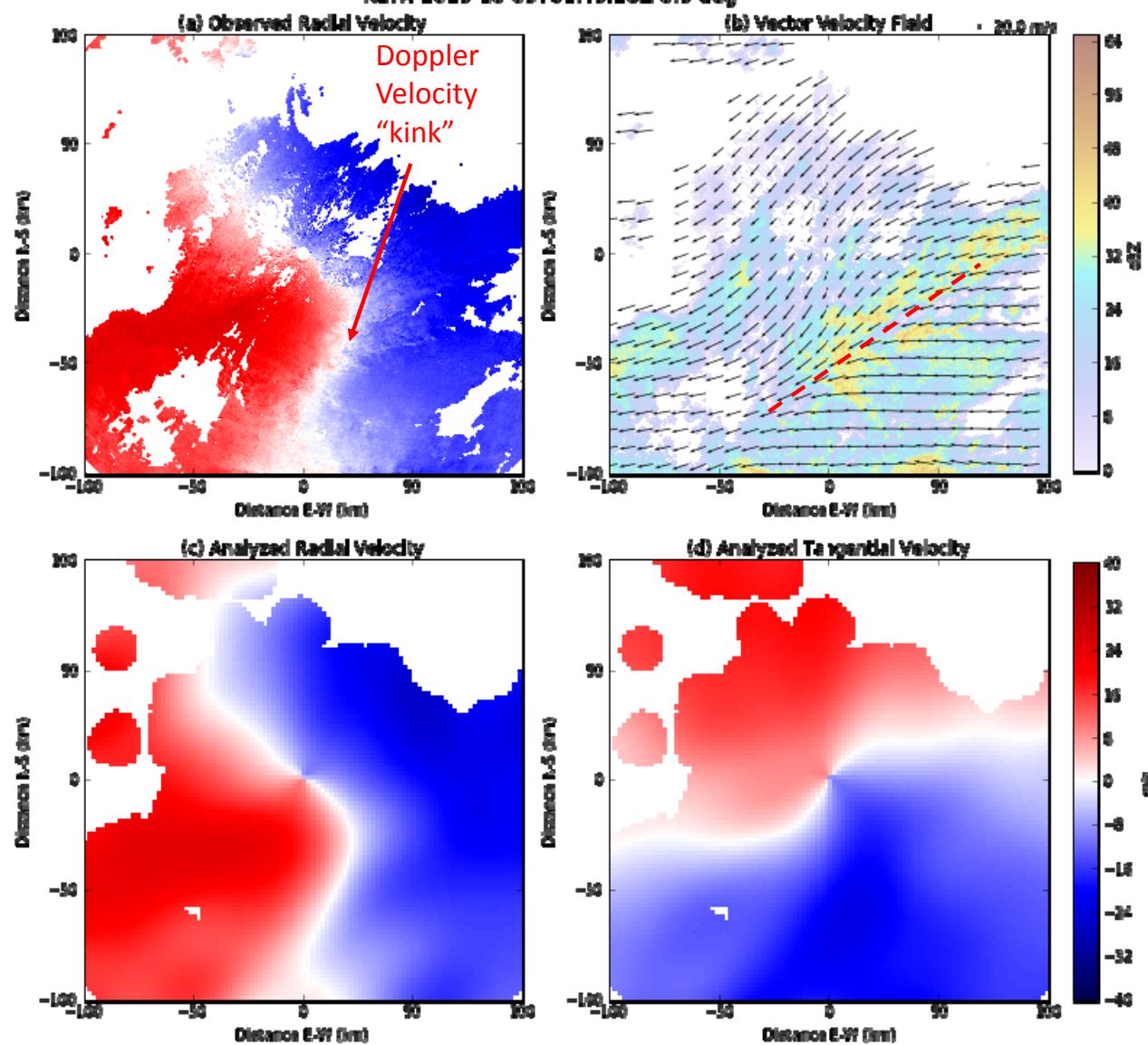
10/05/2015, 0148 UTC

SingleDop = White
ASCAT-B = Black





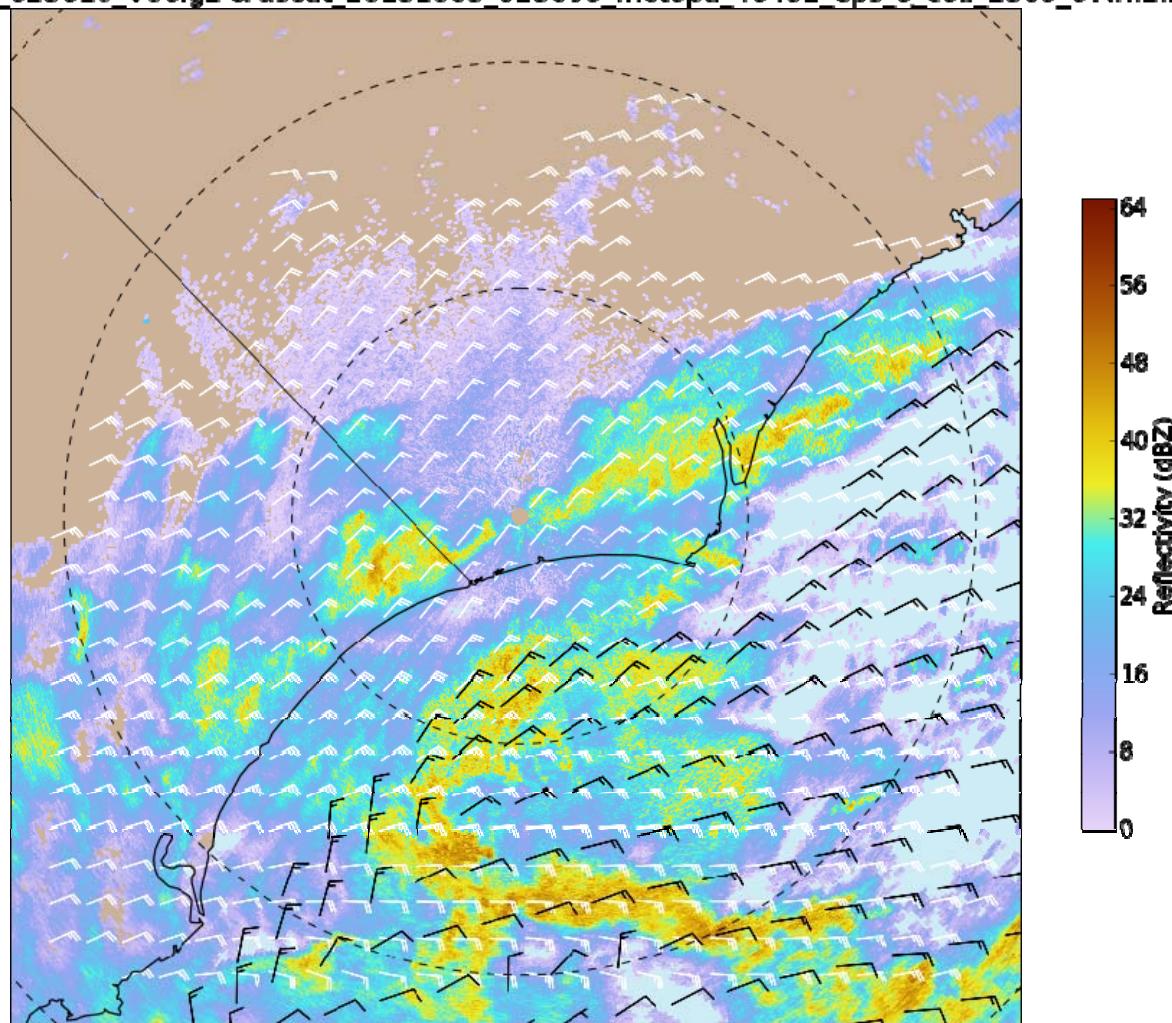
KLTX 2015-10-05T01:49:28Z 0.5 deg



KLTX20151005_023610_V06.gz & ascat_20151005_023000_metopa_46491_eps_o_coa_2300_ovw.l2.nc.gz

10/05/2015, 0236 UTC

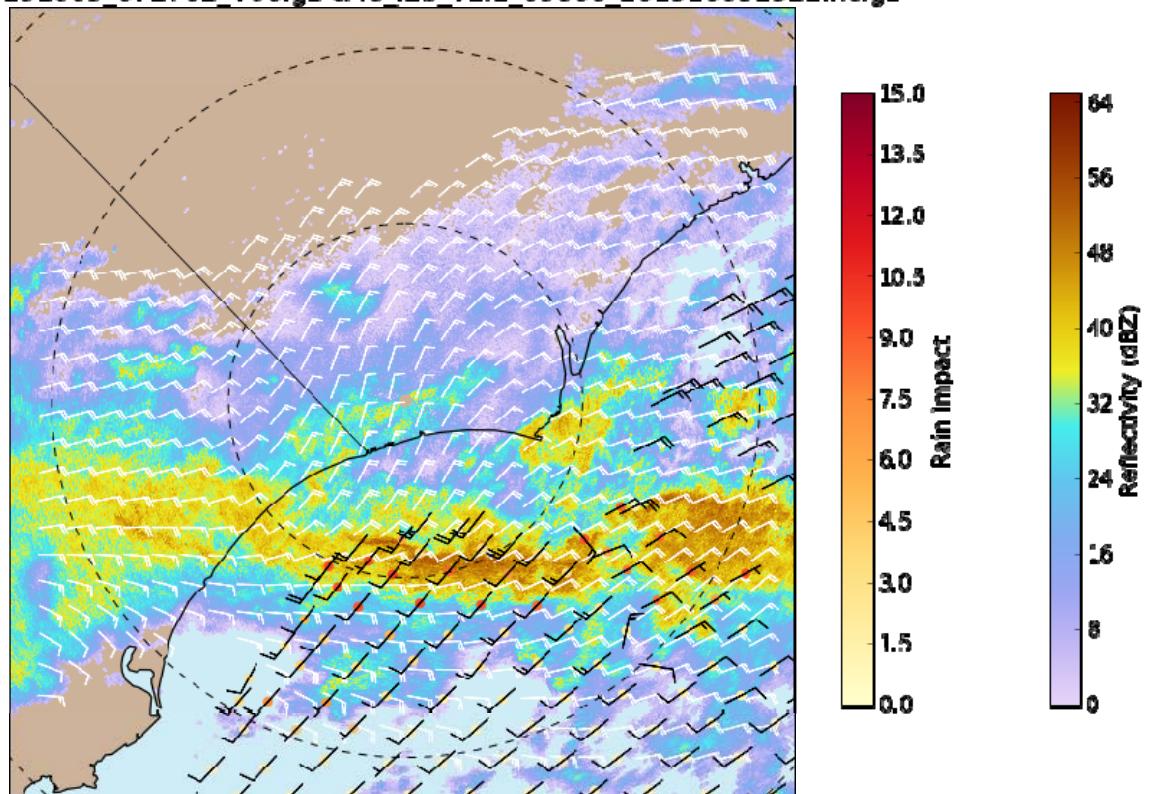
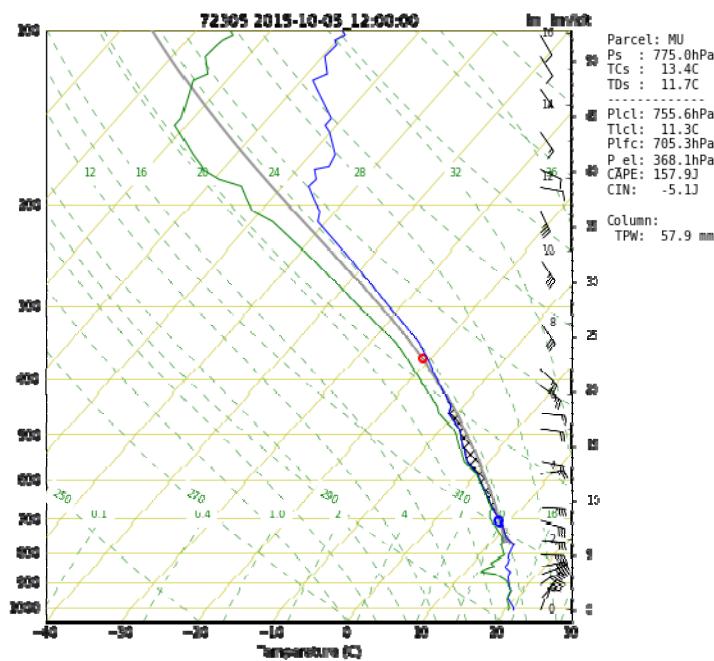
SingleDop = White
ASCAT-A = Black



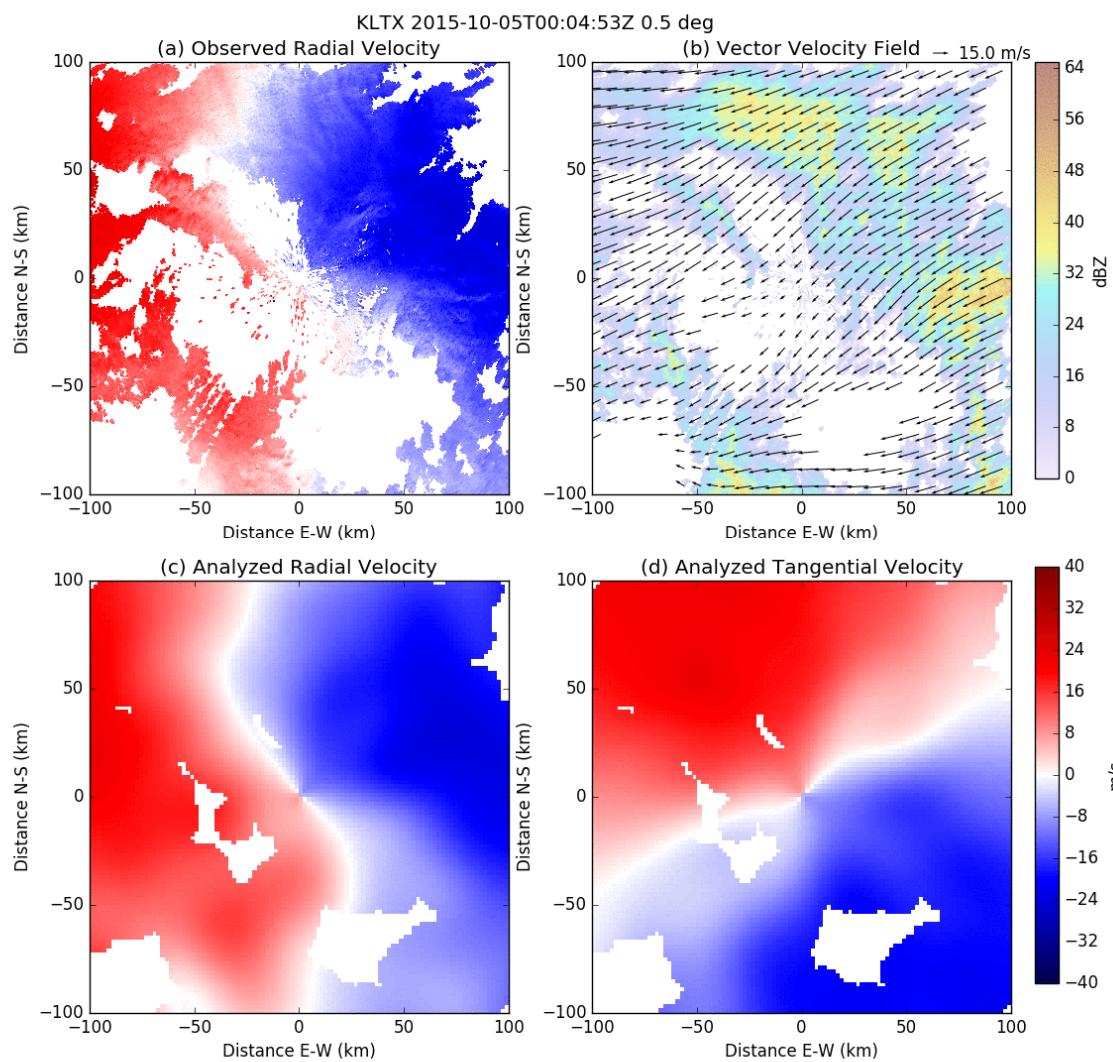
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RapidScat = Black

10/05/2015, 0727 UTC

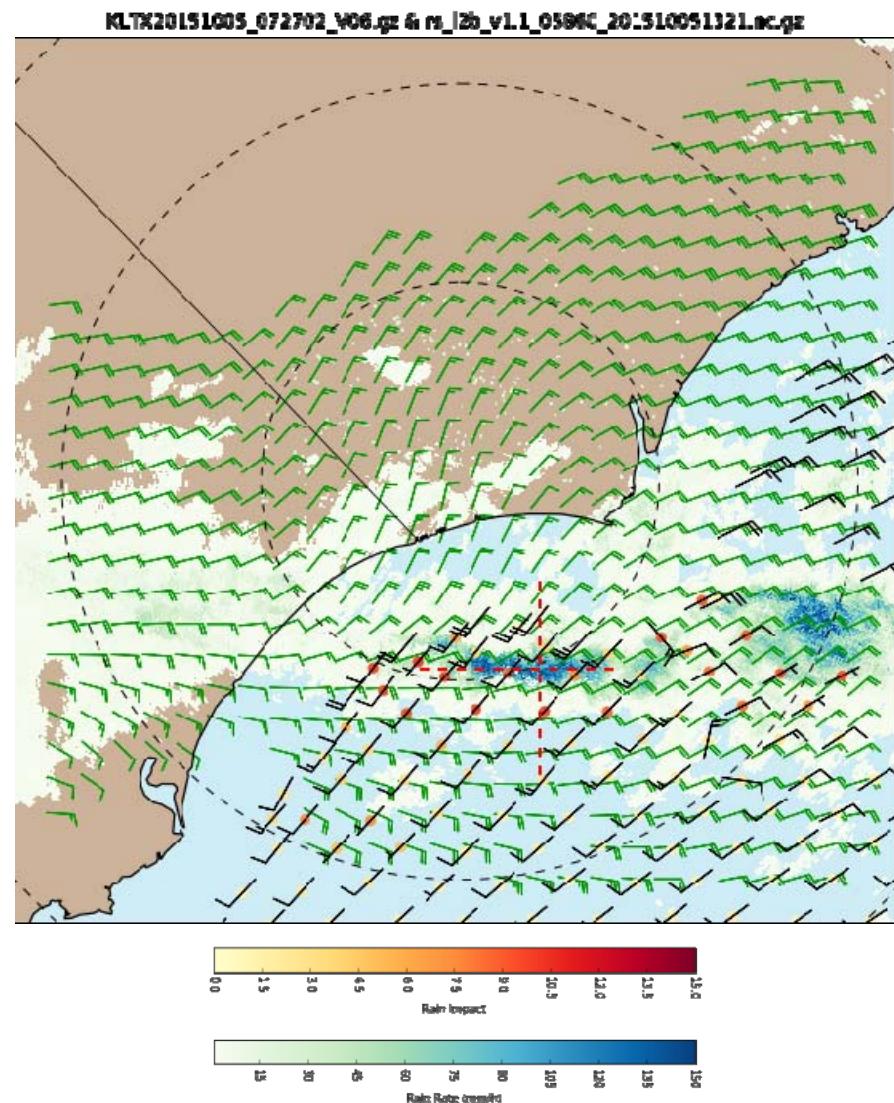
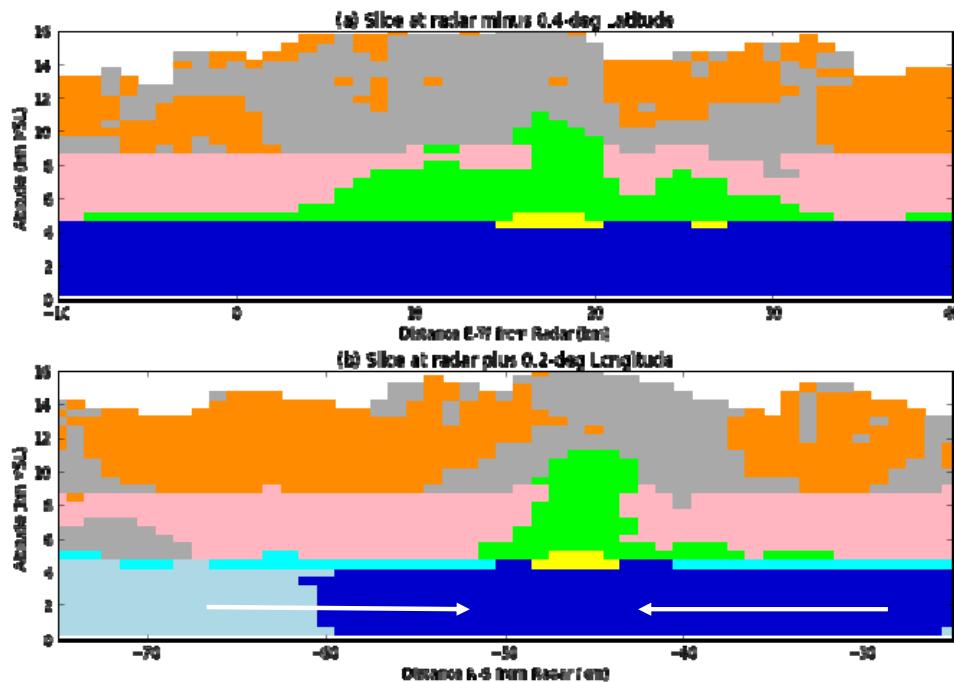
KLTX20151005_072702_V06.gz & rs_l2b_v1.1_05860_201510051321.nc.gz



KLTX
00-08 UTC
10/05/2016



Blending in rainfall and microphysical information from polarimetric radar ...



Conclusions

- Single-Doppler wind retrievals demonstrate value for evaluating scatterometer wind measurements near precipitation, and as a complementary source of wind information in concert with scatterometers
- Caveats must be kept in mind – scatterometer rain impacts, 10-m winds vs. 2D winds on conical PPI surface
- Examples demonstrate that scatterometers may be used to characterize mesoscale wind features that are helping organize precipitation systems, but proceed with caution!
- Multi-decade NEXRAD dataset now on Amazon Web Services, multi-decade scatterometer data on OPeNDAP @ PO.DAAC.
Hmm ...