Apologies from:

Preliminary results of the HY-2B Scatterometer

Juhong Zu (NSOAS), Mingsen Lin, Yi Zhang, Zhixiong Wang, Wenming Lin, Ad Stoffelen and Anton Verhoef

Rather:

HY-2B validation results at KNMI

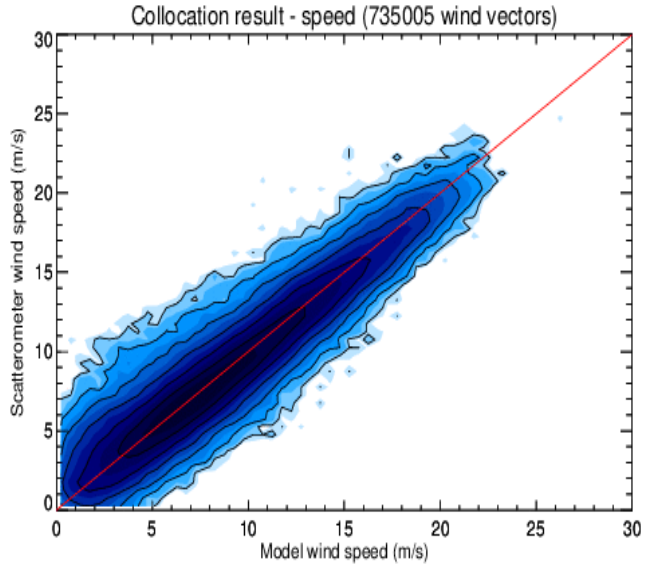
Anton Verhoef, Ad Stoffelen

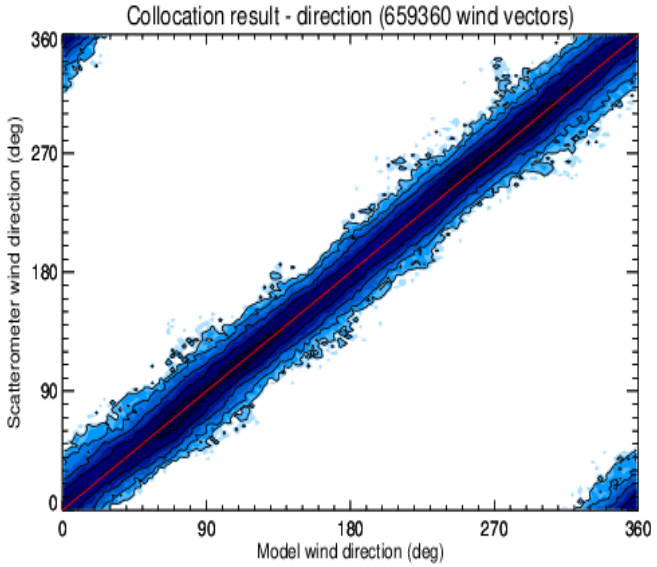
April 2019

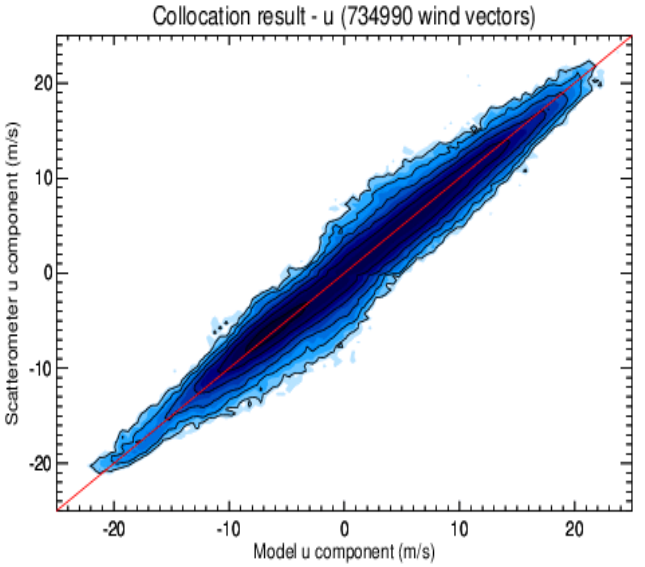
Introduction

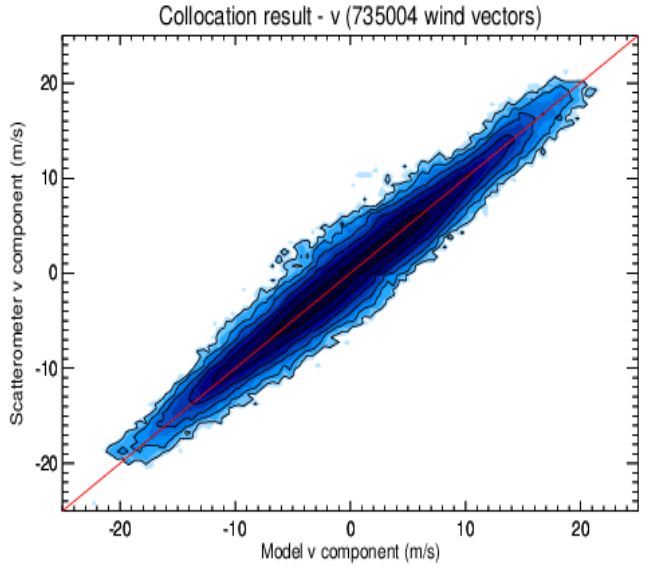
- We are very grateful for the data!
- Level 1b and level 2b data are received from NSOAS on a daily basis
- Level 2b data are available in two flavours: ‘DPS’ (processed using NSOAS wind processor) and ‘PWP’ (processed by NSOAS using PenWP);
- Level 1b data are processed at KNMI using PenWP, fixed sigma0 corrections are applied to obtain wind speed biases vs. ECMWF as low as possible
- Correction is +0.70 dB for HH pol and -0.68 dB for VV pol, -0.54 dB for VV pol outer swath, these calibrations are optimized to reduce systematic wind retrieval direction biases as much as possible
- The NSCAT4DS Geophysical Model Function is used
- Backscatter values are corrected for Sea Surface Temperature (SST), a correction depending on polarization, wind speed, SST, and incidence angle is applied
- For the analysis of the NSOAS level 2b data, we have collocated the data with the same ECMWF winds as used in the KNMI product, and used the same orbits
- We also show some comparisons with HY-2A and ScatSat-1 winds produced at KNMI

KNMI PenWP winds vs. ECMWF









- Results look quite good, similar to results from other Ku-band rotating instruments
- As compared to HY-2A, we get more low speed winds (< 1 m/s) thanks to the ‘negative sigma0’ flag in L1B

Statistics scatterometer vs. ECMWF

	KNMI PenWP	NSOAS DPS	KNMI PenWP HY-2A	KNMI PenWP ScatSat-1
Wind speed bias	-0.08	0.22	0.03	-0.02
Stdev *u*	1.15	1.93	1.42	1.26
Stdev *v*	1.12	1.86	1.41	1.23
Stdev wind dir	9.08	16.34	12.18	9.97

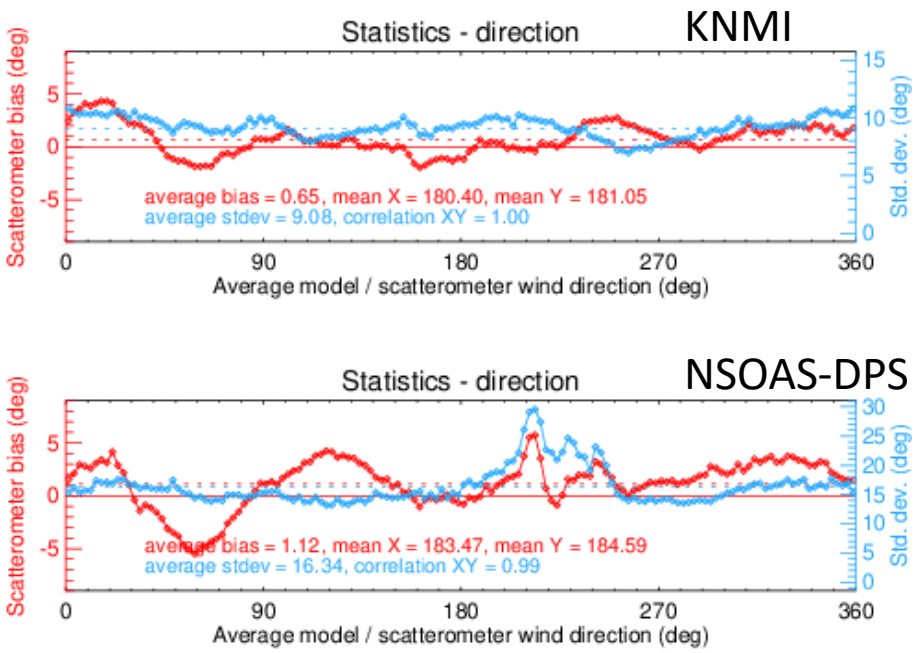
- KNMI HY-2B winds have significantly lower standard deviations than KNMI HY-2A winds, reason is not entirely clear but may be connected to absence of 'negative sigma0' flag
- KNMI HY-2B winds have lower standard deviations than ScatSat-1 winds, probably due to lower instrument noise?

Statistics scatterometer vs. buoys

	KNMI PenWP	NSOAS DPS	KMMI PenWP HY-2A	KNMI PenWP ScatSat-1
Wind speed bias	0.06	0.23	0.14	0.21
Stdev *u*	1.73	2.01	2.09	1.99
Stdev *v*	1.82	2.12	2.12	1.96
Stdev wind dir	17.23	19.20	23.29	20.25

- HY-2B results for KNMI and NSOAS winds have been obtained using collocated data sets, i.e., they are based on the same set of WVCs/buoy winds
- Trends and conclusions from buoy comparisons are more or less the same as those from ECMWF comparisons

Wind direction bias w.r.t. ECMWF



- NSOAS – DPS winds have somewhat larger systematic wind direction biases than KNMI, refined PenWP calibrations and SST corrections helped to minimize the biases as compared to the initial results from KNMI with PenWP

Other remarks and conclusions

- HY-2B winds are regularly processed at KNMI in near-real time since 16 January 2019, the data quality and instrument calibration is very stable since then
- The timeliness varies between ~100 and ~800 minutes, as expected for a data downlink twice per day
- We look forward to further downlinks at a Finnish ground station (EUMETSAT)
- HY-2B winds from PenWP show very good statistics as compared to ECMWF and buoy winds, better than HY-2A and ScatSat-1
- We did not yet investigate the reason for the large difference between HY-2A and HY-2B winds quality, but we assume that HY-2A quality could be largely improved by implementing the ‘negative sigma0’ flag
- Juhong Zou and Zhixiong Wang are both visiting KNMI this summer to proceed on HY2B wind processing and quality monitoring