

Analysis of Coastal Winds Derived From QuikSCAT at OSI-SAF



G. Grieco¹ B. Stiles² F. Cossu³ M. Portabella³ A. Stoffelen⁴ A. Verhoef⁴
J. Vogelzang⁴

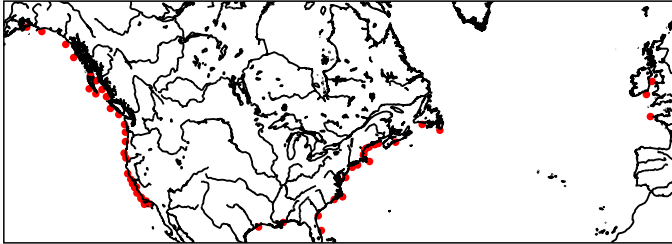
8th May 2025

¹CNR-ISMAR, ²NASA-JPL, ³BEC-ICM, ⁴KNMI

Outline

- Dataset description
- Methodology
- Results
- Preliminary Conclusions
- Future plans

Dataset description



Buoy location

- Period: 2007
- Wind sources:
 - OSI-SAF 12.5 km (noise-reg)
 - ECWMF operational winds
 - JPL (4.1 v1.1)
 - NCEP winds
 - ECMWF-MARS buoy

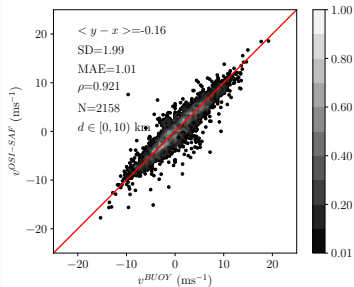
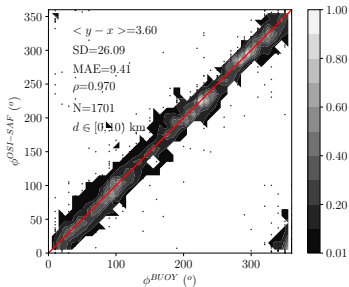
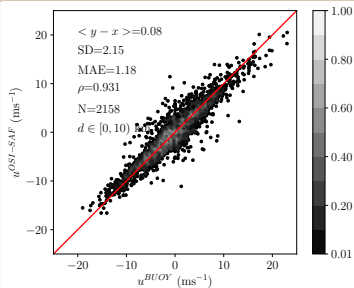
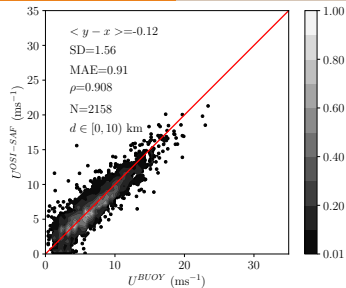
Quality Control

- JPL:
 - `quality_indicator` ≤ 2 :
 - likely significant error **excluded**
 - no winds retrieved due to quality control **excluded**
 - no data over liquid water in cell **excluded**
- OSI-SAF:
 - `knmi_quality_control_fail` = 0
 - `variational_quality_control_fails` = 0
- MARS buoys: **Black-listed excluded**

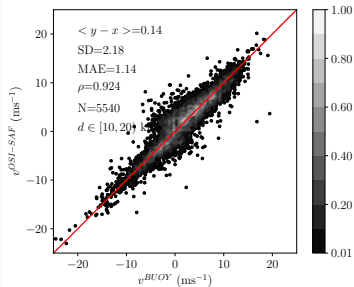
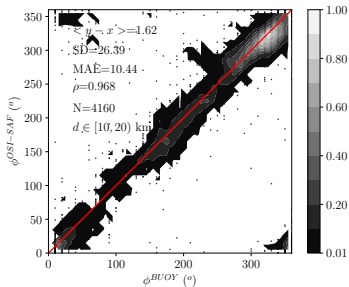
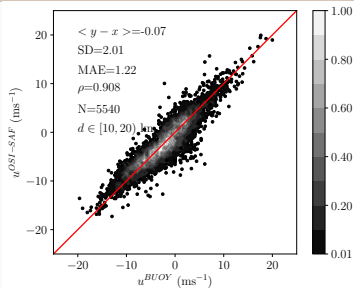
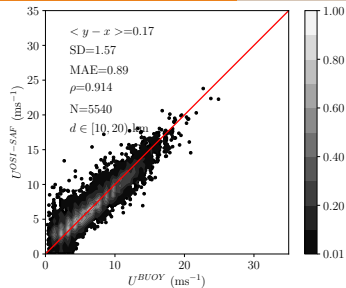
Methodology

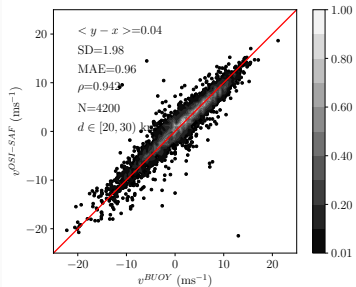
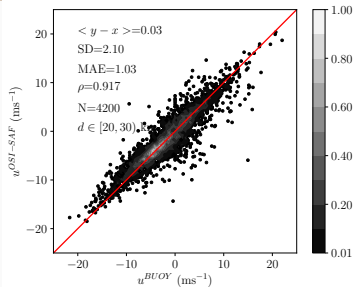
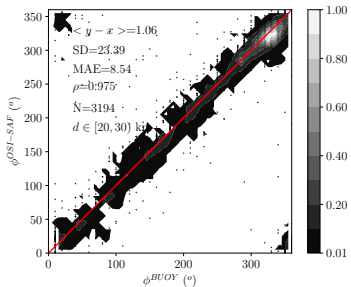
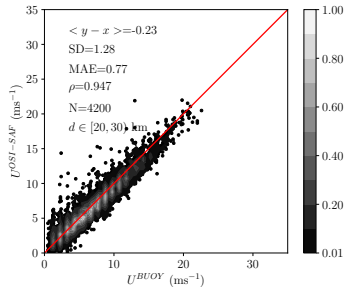
- Collocations within 60 km to the coast
- Triple collocation:
 - **buoy/OSI-SAF/ECMWF**: 24,059 (**19,817**, $d \in [0, 40)$ km)
 - **buoy/JPL/NCEP**: 23,252 (**19,065**, $d \in [0, 40)$ km)
- Triple collocation on intersection: 22,577 (**18,703**, $d \in [0, 40)$ km)
 - **buoy/OSI-SAF/ECMWF**
 - **buoy/JPL/ECMWF**
- Reference system: scatterometer
- $r^2 = 0$

OSI-SAF

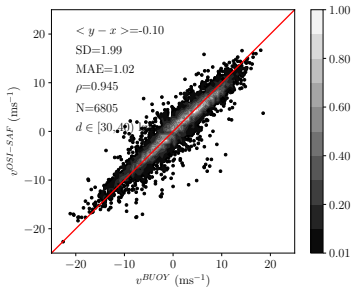
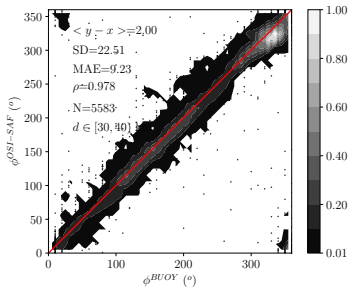
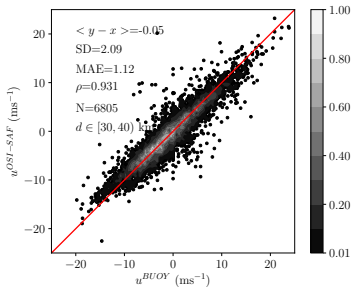
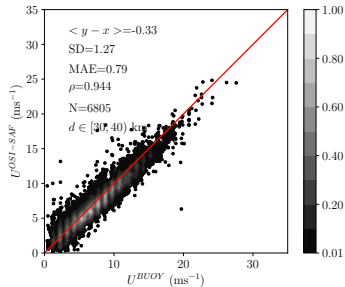


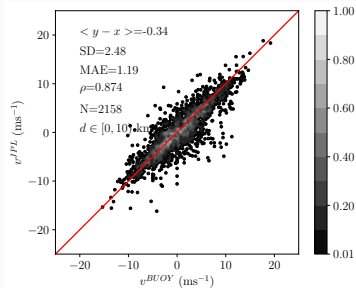
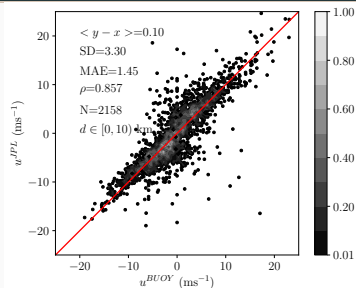
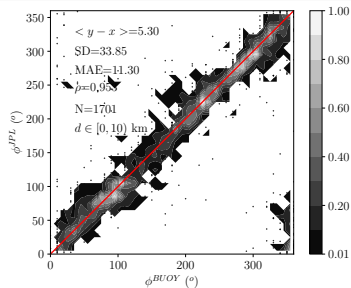
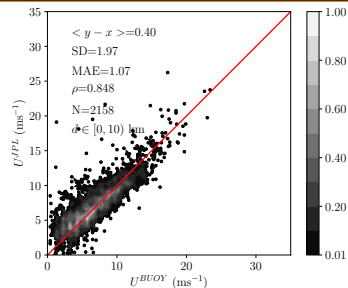
OSI-SAF

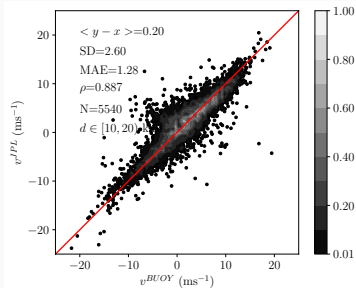
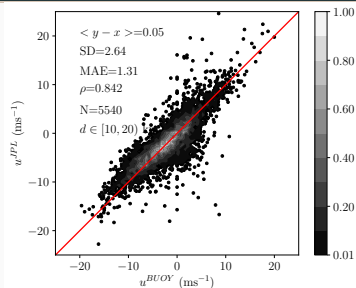
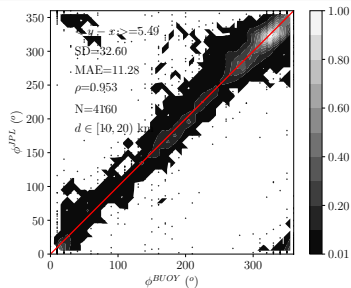
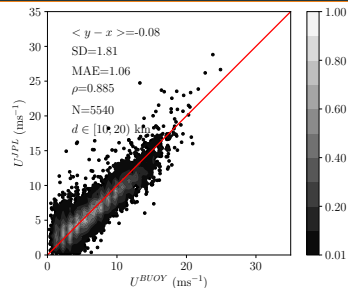


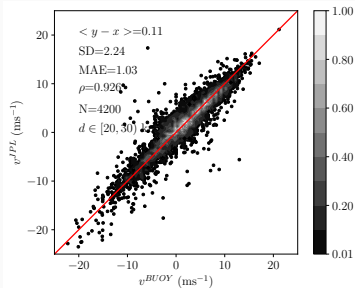
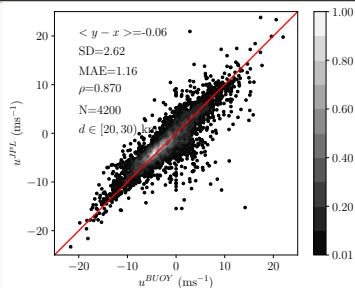
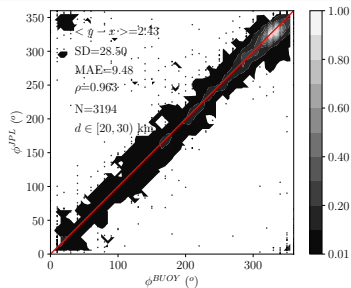
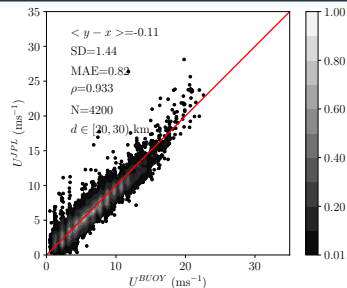


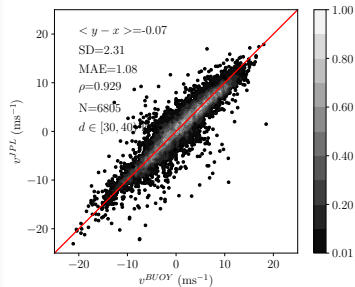
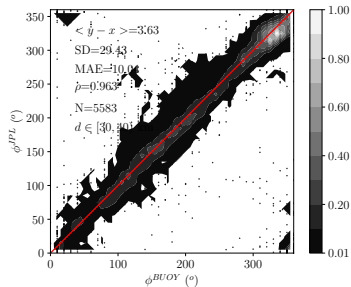
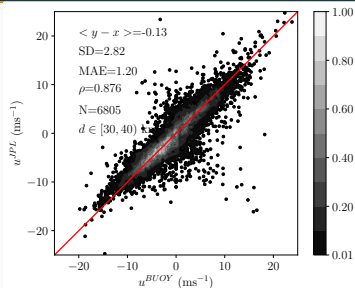
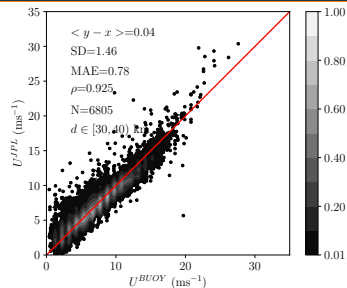
OSI-SAF



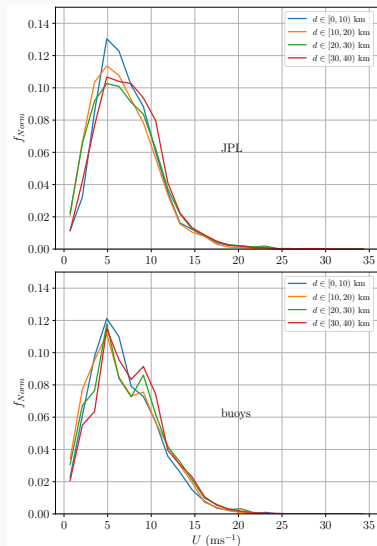
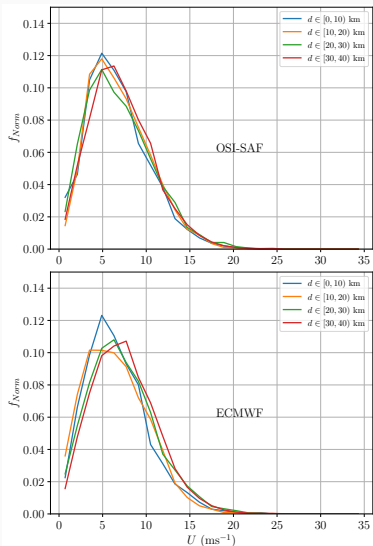








Wind speed distribution



MLE vs U

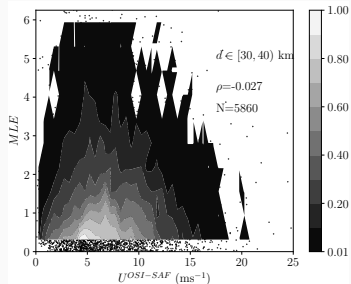
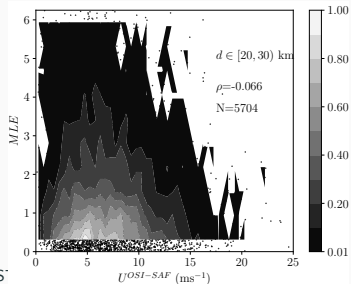
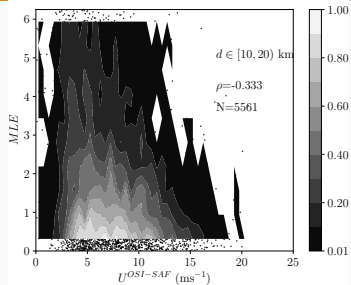
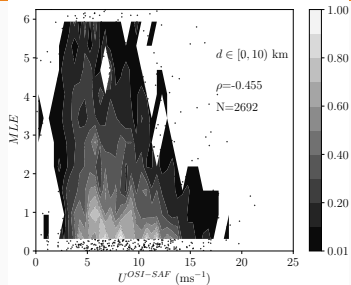


Table 1: Intersection

	buoy	OSI-SAF	ECMWF
ϵ_u	1.70	0.79	1.36
ϵ_v	1.60	0.80	1.31

Table 2: Intersection

	buoy	JPL	ECMWF
ϵ_u	1.73	1.53	1.34
ϵ_v	1.59	1.25	1.33

Preliminary Conclusions

- OSI-SAF and JPL winds are high-biased @ low-wind regimes
- This is particularly true close to the coast
- Any residual land-contamination?
- JPL winds seem noisier than OSI-SAF

Future plans

- Segregate the analysis according to swath location: outer-sweet-nadir
- Analyze the dependency on wind direction w.r.t. the coast
- Remove biases from retrieved winds

Back-up slides

Table 3: Intersection

	buoy	OSI-SAF	NCEP
ϵ_u	1.56	1.08	2.09
ϵ_v	1.54	0.93	1.98

Table 5: Original

	buoy	OSI-SAF	ECMWF
ϵ_u	1.71	0.81	1.36
ϵ_v	1.61	0.82	1.31

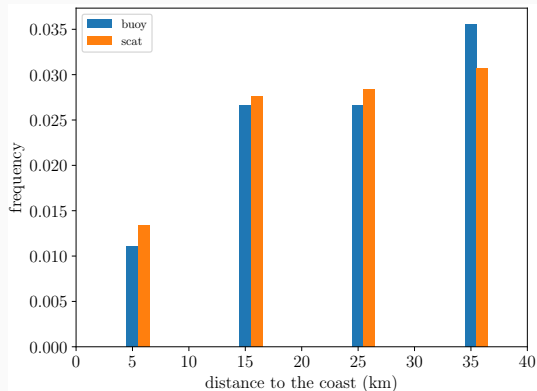
Table 4: Intersection

	buoy	JPL	NCEP
ϵ_u	1.86	1.41	1.73
ϵ_v	1.73	1.09	1.77

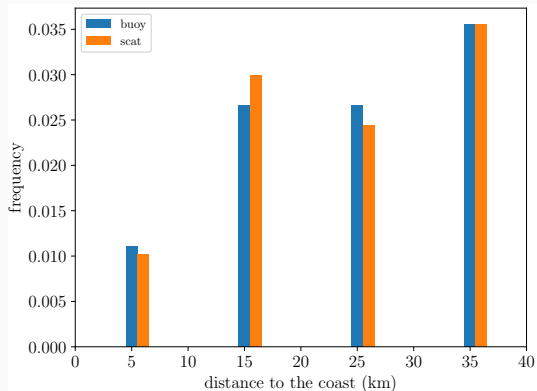
Table 6: Original

	buoy	JPL	NCEP
ϵ_u	1.87	1.42	1.73
ϵ_v	1.75	1.12	1.78

Sampling



OSI-SAF



JPL