ASCAT-6.25
Von Karman vortices
Canary Isles

NWP SAF
Numerical Weather Prediction

# ASCAT-6.25 product quality

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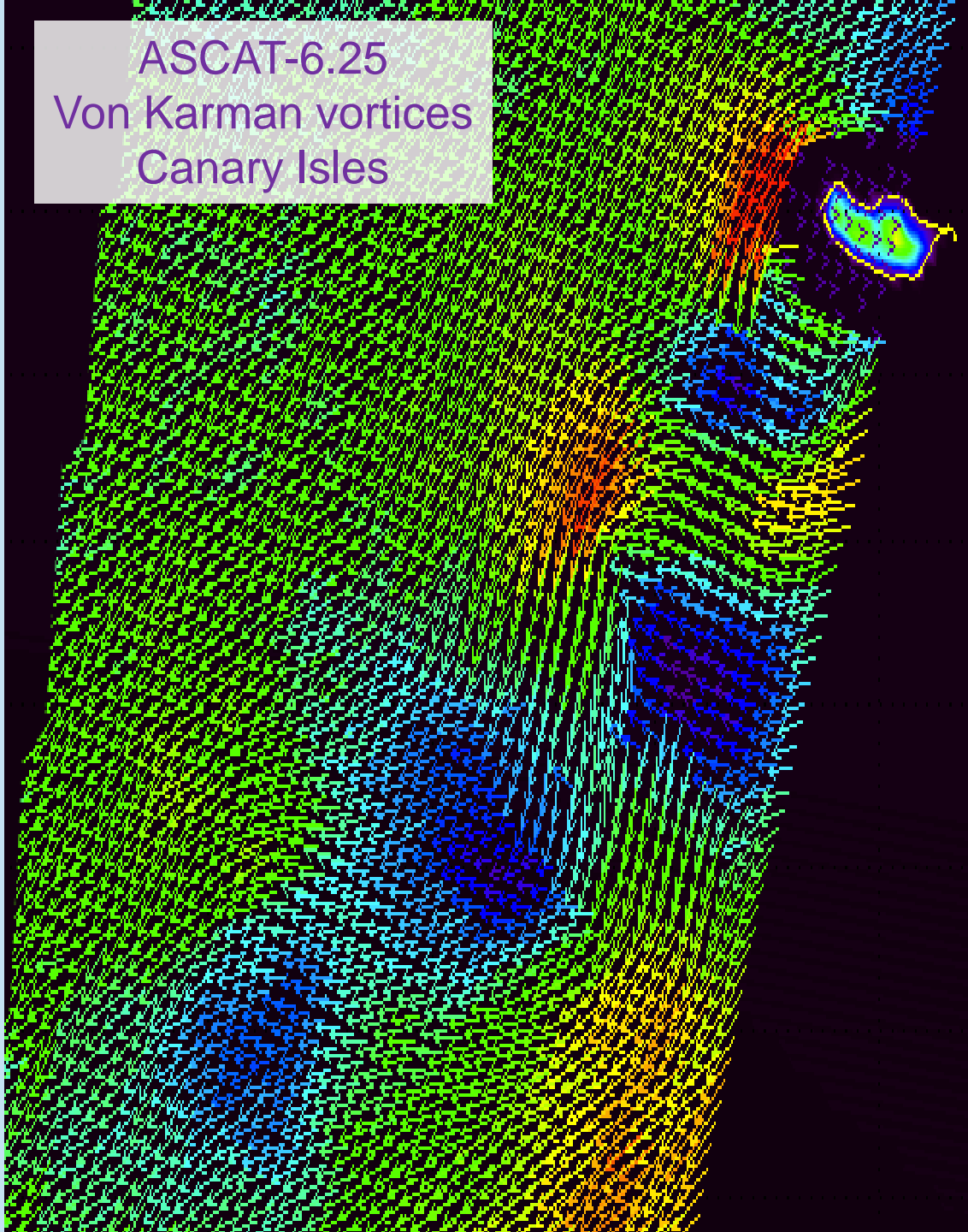
Trial ASCAT-6.25 processing

- ASCAT-6.25 processing already in AWDP for some years as extension of coastal processing (unweighted σ_0 averaging over circle instead of Hamming weighted averaging over square)

- ASCAT-6.25 is simple downscaling by factor of 2 of ASCAT-coastal; a 6.25 grid is now provided by EUMETSAT in the L1B full resolution data

- KNMI quality control also for 6.25 km grid size: inclusion of K_p and MLE tables in AWDP

- QC rejection rates:
  - 0.16% ASCAT-6.25
  - 0.28% ASCAT-12.5
  - 0.47% ASCAT-25

- Interest from various beta-users

Cumulative spatial response function (CSRF)
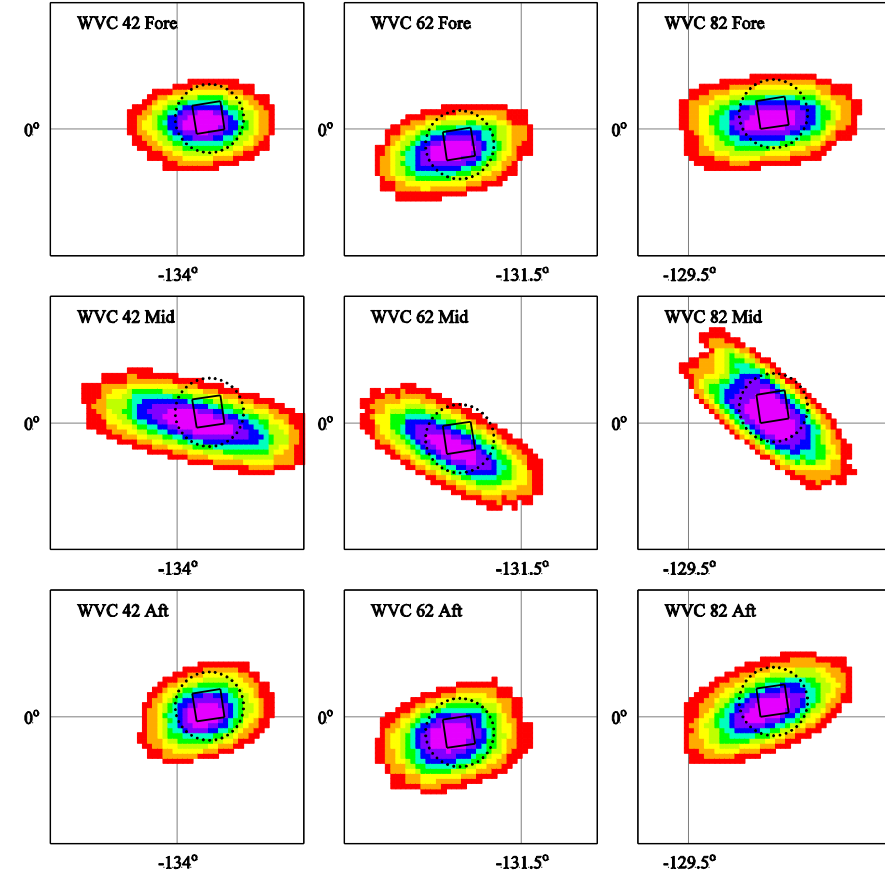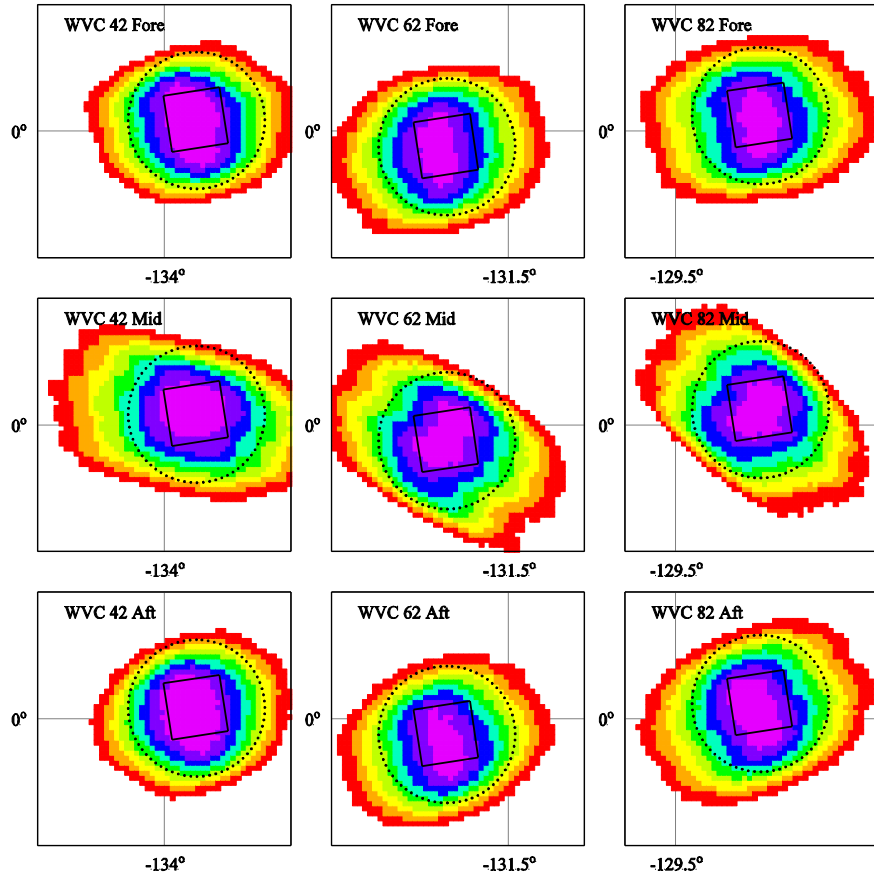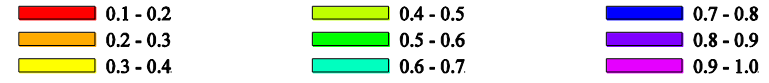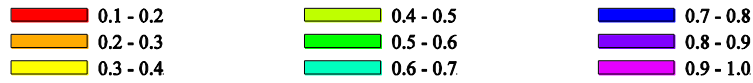
ASCAT-coastal
solid box: WVC
dotted circle: aggregation area

ASCAT-6.25
Smaller CSRF (but poorer match with aggregation area) => more detail? Or noise?

Comparison to buoy 10-min winds

- ASCAT-6.25 processing with various values for the averaging radius R (R=15 km corresponds to oversampled ASCAT-coastal)
- Only common buoy collocations (identical weather in all rows)
- All ASCAT-A data from August 2013

R (km)	σ_s (m/s)	σ_{dir} (deg)	σ_u (m/s)	σ_v (m/s)	σ_l (m/s)	σ_t (m/s)	N
5.0	1.01	17.9	1.41	1.70	1.70	1.42	2682
7.5	0.99	16.6	1.38	1.64	1.64	1.39	2682
10.0	0.98	16.9	1.37	1.62	1.61	1.37	2682
15.0	0.98	16.8	1.36	1.59	1.59	1.36	2682
precision	0.02	0.3	0.03	0.03	0.03	0.03	

- Buoy comparison becomes worse as R decreases!
- Same result for ASCAT-6.25/ASCAT-coastal buoy comparison

Spatial variance analysis
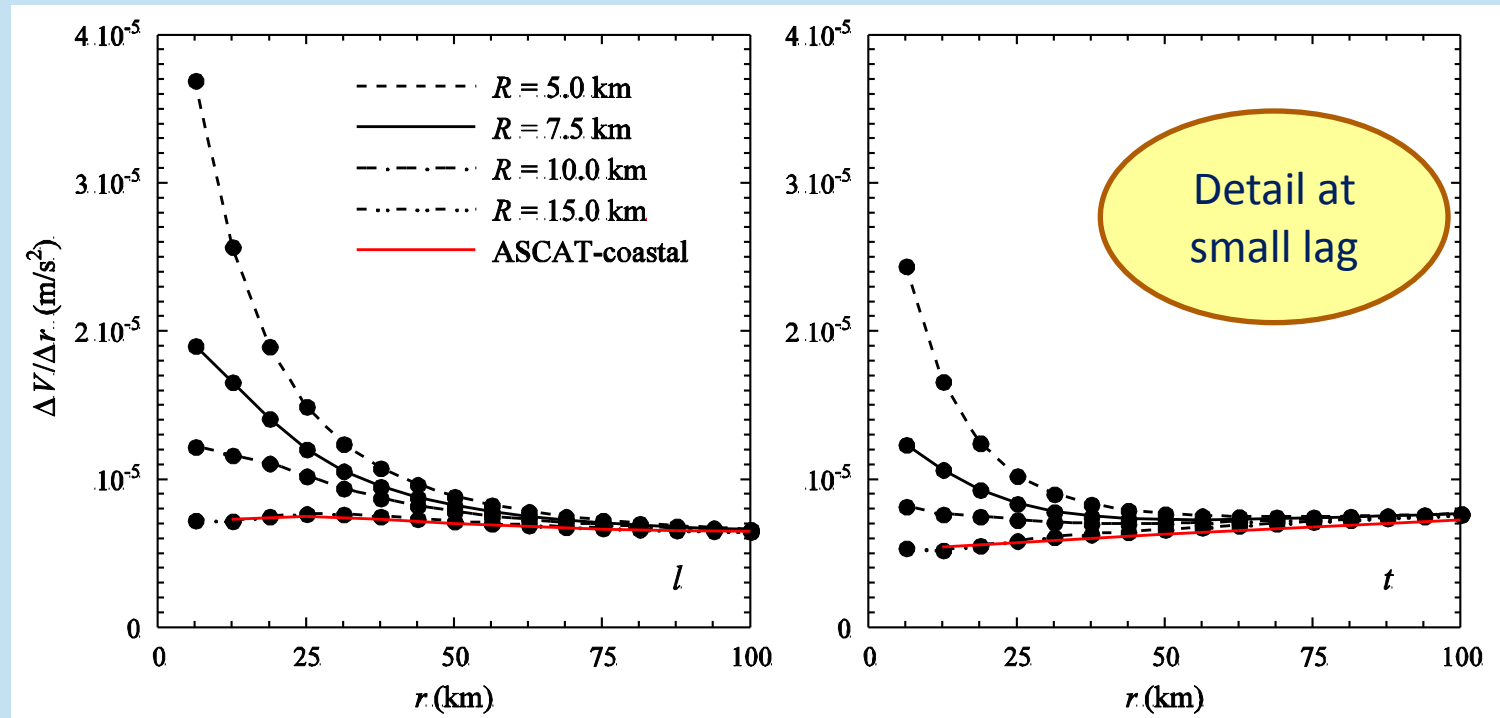
- Variance as function of lag size $V(r)$

- Variance increment $\dfrac{\Delta V(r)}{\Delta r} = \dfrac{V(r_{i+1} - r_i)}{r_{i+1} - r_i}$ shown

- Peak at small lags that increases with decreasing aggregation radius R and decreases with increasing r => correlated noise.

Spatial variance analysis results

- Excess variance w.r.t. ASCAT-coastal (R = 15 km) can be related to excess noise, σ², and correlation at lag *L*, ρ_L

| type	R (km)	Longitudal component l			Transversal component t		
		σ^2 (m²/s²)	ρ_1	ρ_2	σ^2 (m²/s²)	ρ_1	ρ_2
along track	5.0	0.598	0.420	0.045	0.388	0.400	0.037
	7.5	0.326	0.569	0.125	0.195	0.558	0.114
	10.0	0.173	0.656	0.227	0.098	0.647	0.226
cross track	5.0	0.517	0.228	0.009	0.383	0.257	0.018
	7.5	0.264	0.473	0.062	0.193	0.493	0.069
	10.0	0.138	0.603	0.229	0.100	0.619	0.238

- Considerable amount of noise added when reducing *R*

- Noise is correlated due to overlap in CSRF (and correlations in SRF due to on-board processing and averaging)

Conclusions

- ASCAT-6.25 has smaller CSRF and is in principle able to detect smaller features than ASCAT-coastal. However, the CRSF is noisier because less SRF's contribute.

- ASCAT-6.25 may be useful in studying small features with high SNR (for example von Karman vortices).

- ASCAT-6.25 processing in AWDP will become part of the next AWDP release later this year.

- No near-real-time OSI SAF ASCAT-6.25 product planned – you will have to do your own processing.

- ➢ Mid beam SRF sampling is poorest and could be used as basis for resolution enhancement by an optimised aggregation strategy

ASCAT product improvements

Averaging area
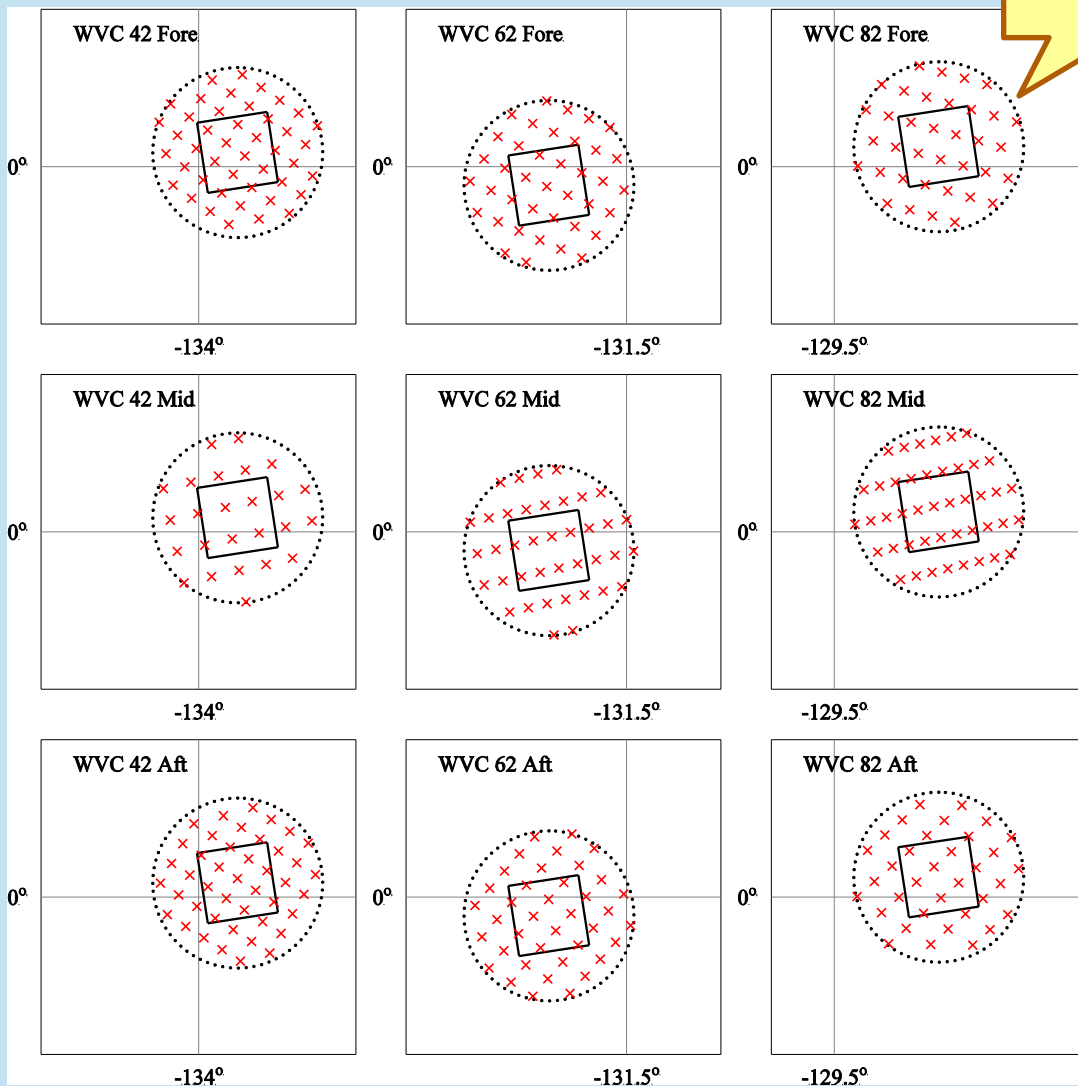
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- Figure shows centers of antenna footprints (red crosses) contributing to WVC (black squares) in ASCAT-coastal

- Low density in mid beam at small incidence

- Define more optimal WVC's w.r.t. footprints