

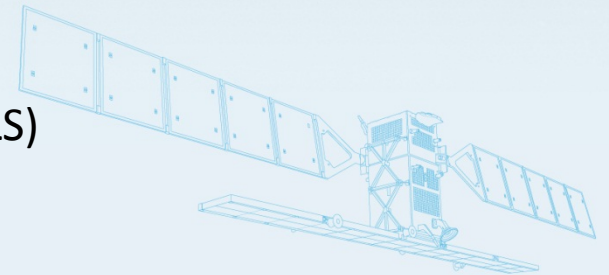
→ SEASAR 2012

The 4th International Workshop on Advances in SAR Oceanography

SAR Wave Processing –

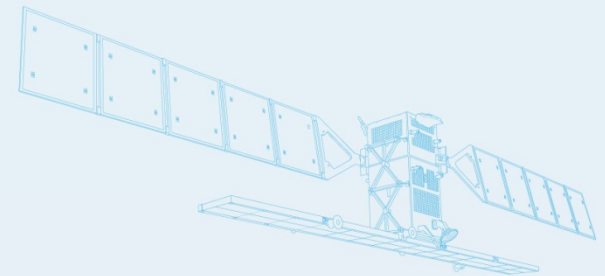
Improvements towards Sentinel-1 mission

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Content

- Introduction
- Processing/product features (new)
- Challenges in wave processing (MTF)
- Examples using ASAR data
- Summary/Future perspectives

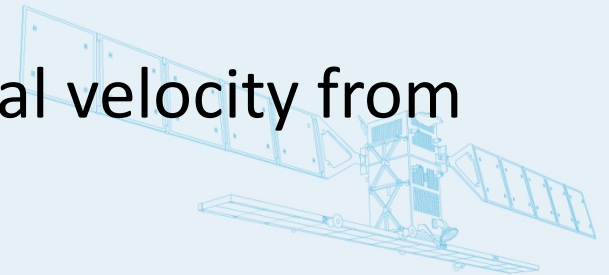


S-1 L2 Ocean Product -Objectives

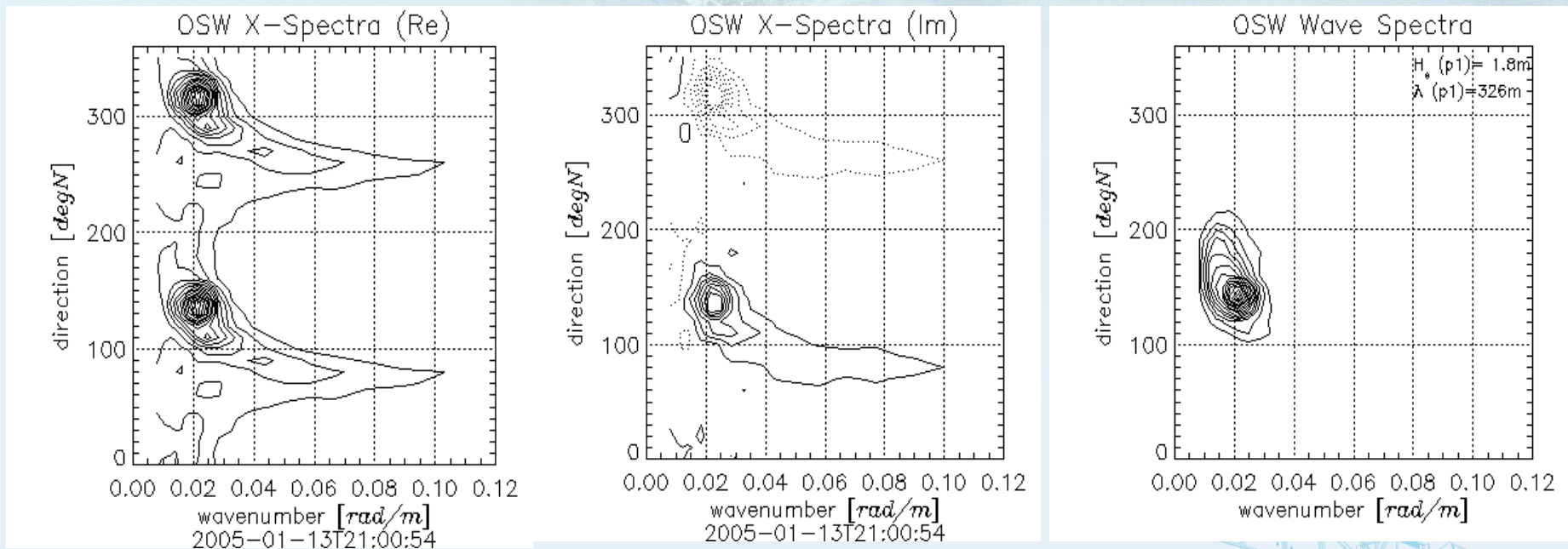
- Based on the heritage of ASAR WM and Wind/Wave/Current project– Sopranos.
- Designed to deliver geophysical parameters related to the wind, waves and surface velocity to a large panel of end-users.
- L2 ocean products are processed by the Level 2 IPF processor and benefit from robust and validated algorithms (except for the Doppler / radial velocity)
- Available for all S-1 modes (co-polarized channels).

New Product Features

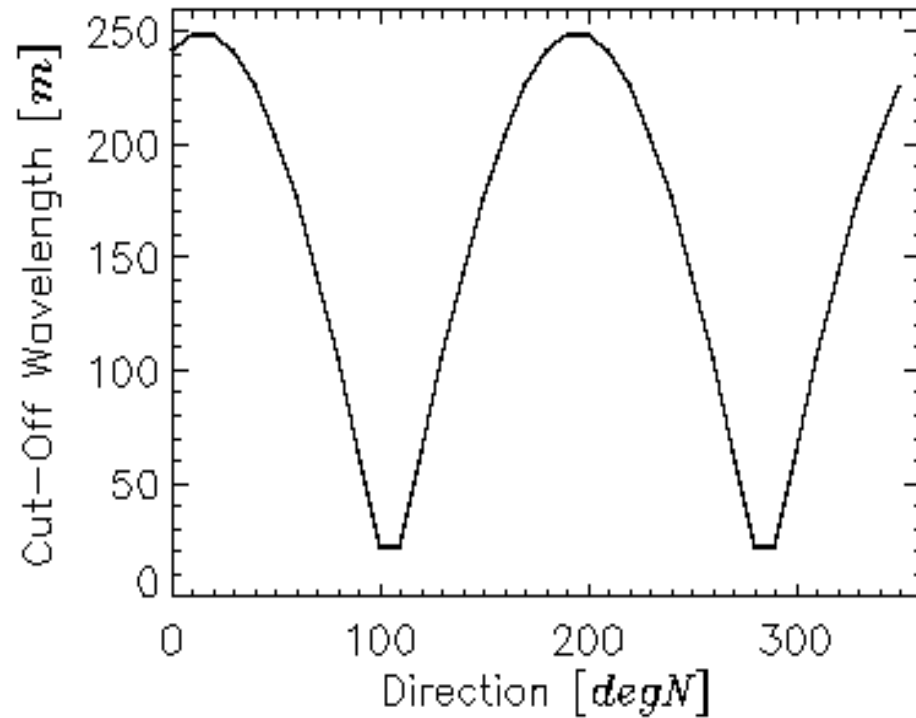
- Both Level 1b and Level 2 in same wave product
- Extended wavelength region, and flexible binsize
- Partitioning
- New cut-off (wave direction dependent)
- Updated MTF
- Landmask/Land coverage
- Access to wind vector, doppler, radial velocity from same ocean L2 product.
- +



Some examples of additional features

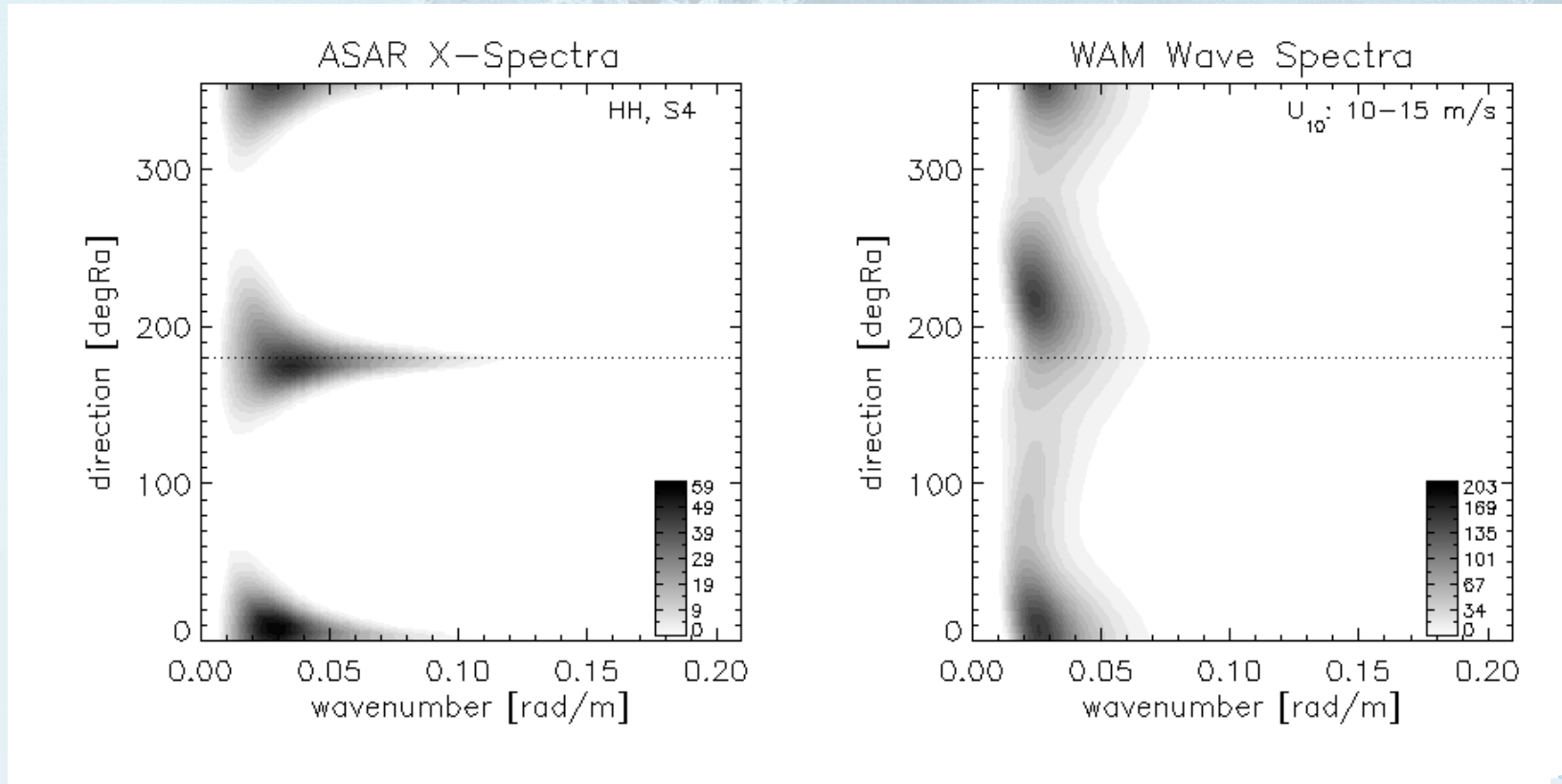


S-1 Level2 product contains both Level1b and Level2 in same product

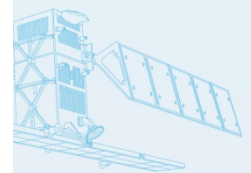
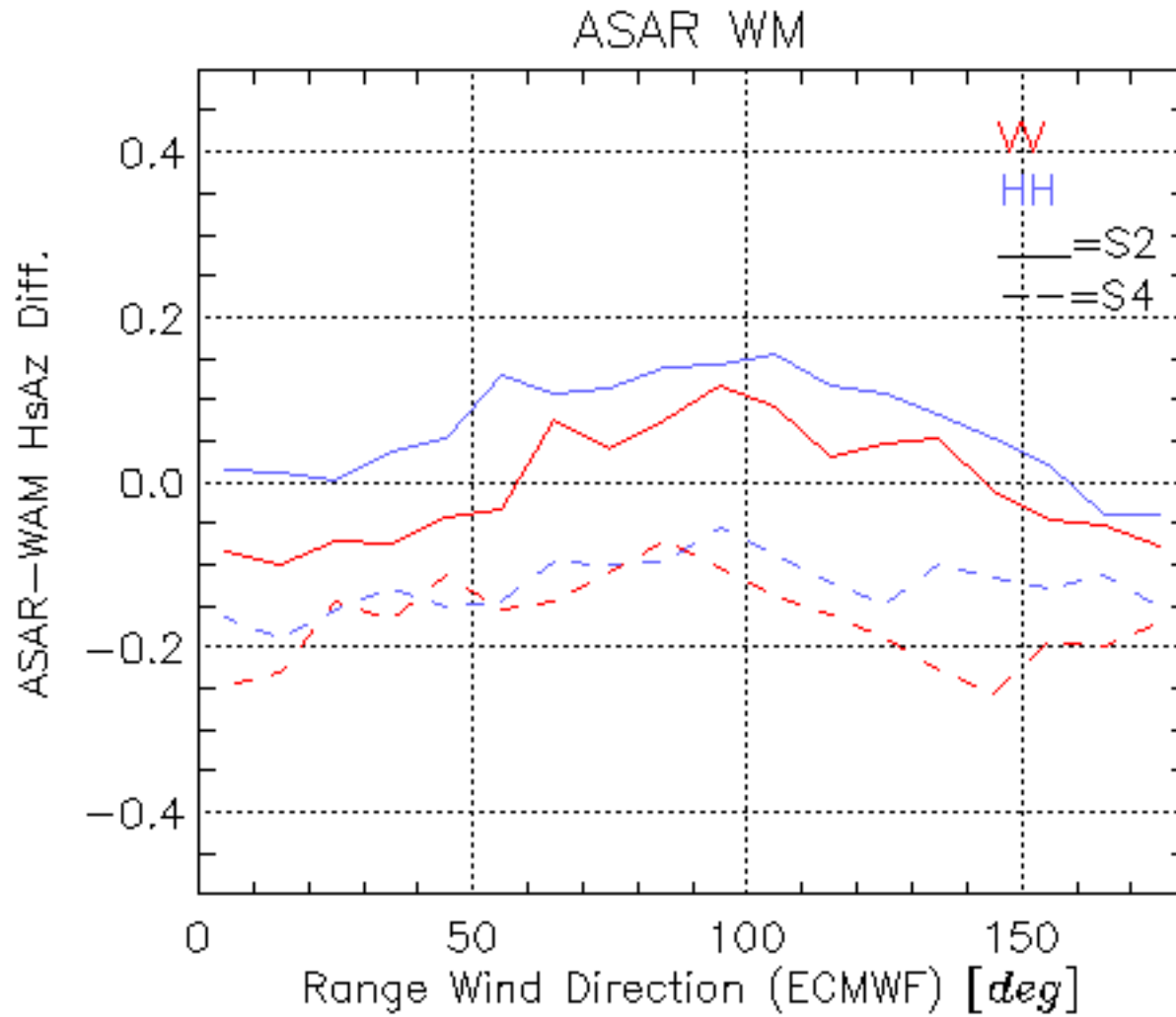


Wave direction dependent cut-off wavelength.

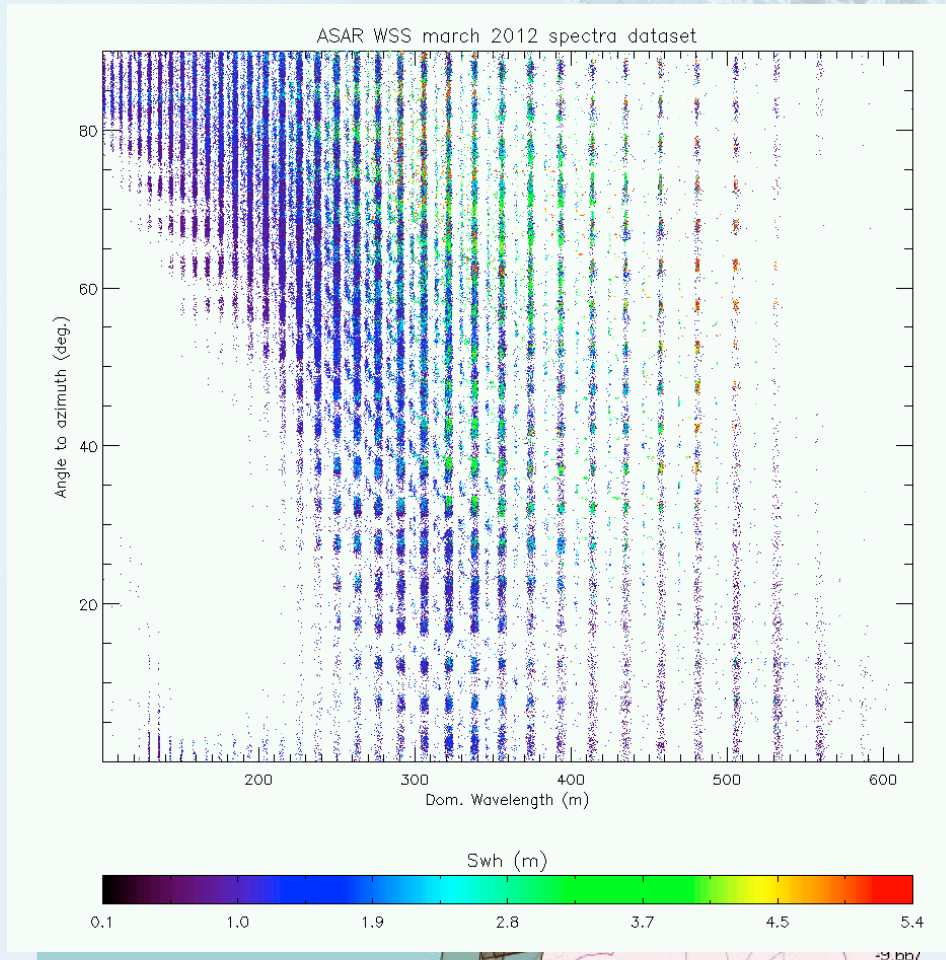
MTF – a challenge



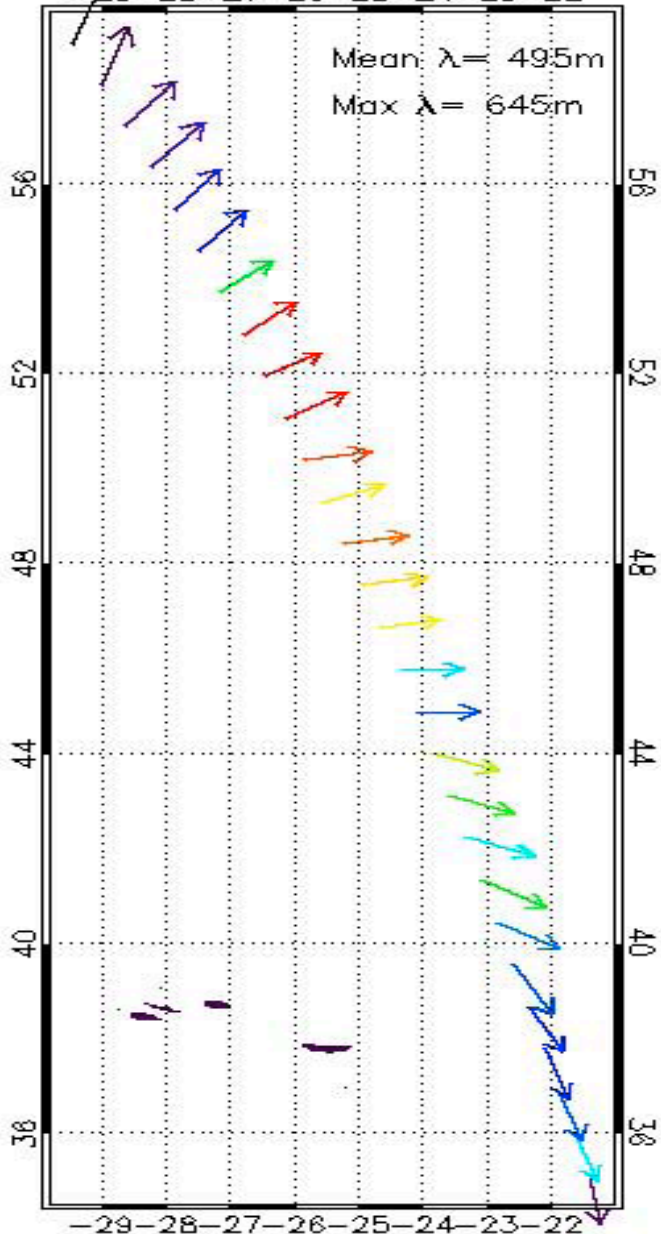
Swath dependency
Wind dependency



Extension of Data Set for MTF analysis

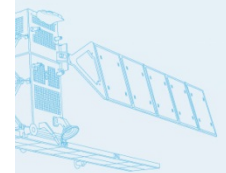
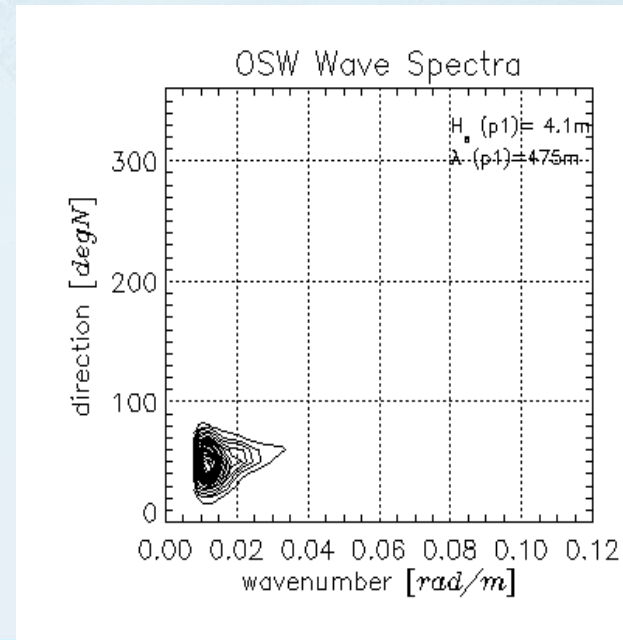


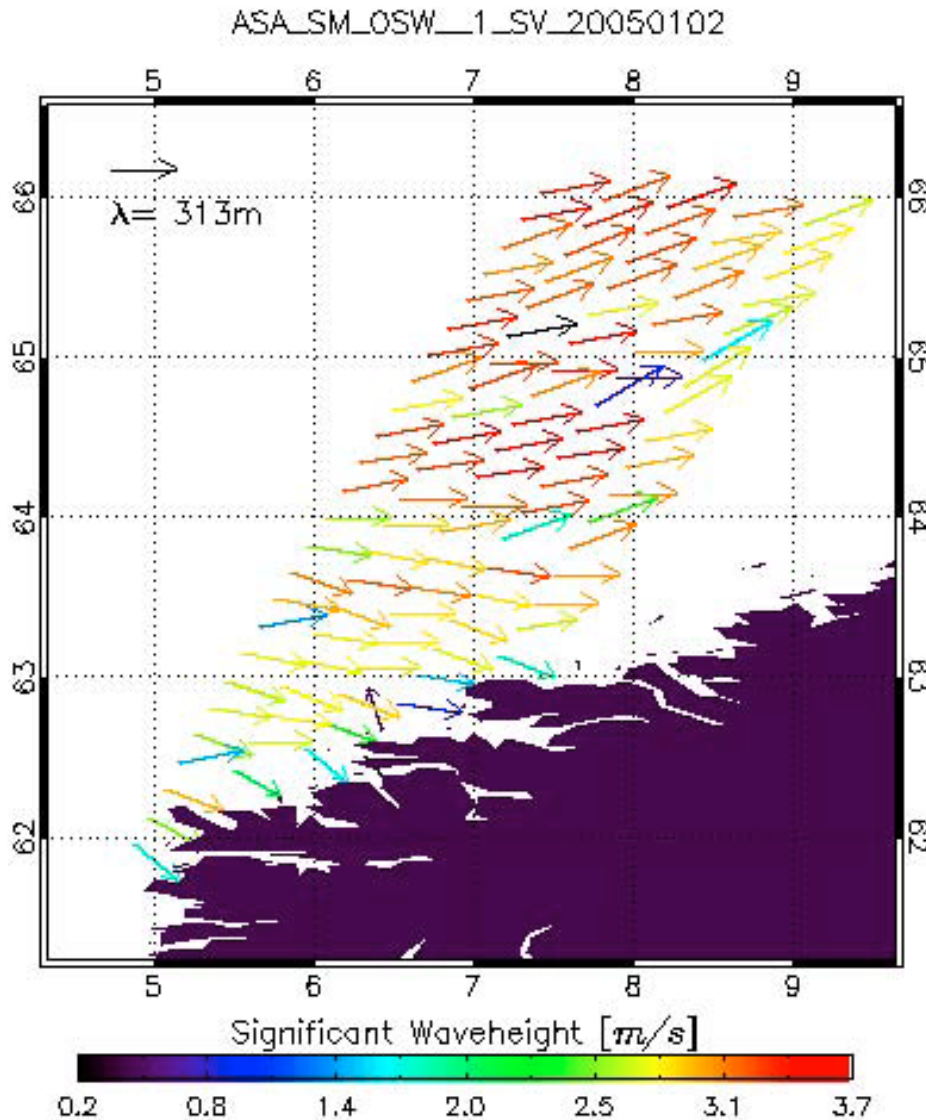
- 500 ASAR WSS scenes processed into spectra at Vigisat
- Collocated with WW3 by Ifremer
- Spans all the wind/wave conditions needed



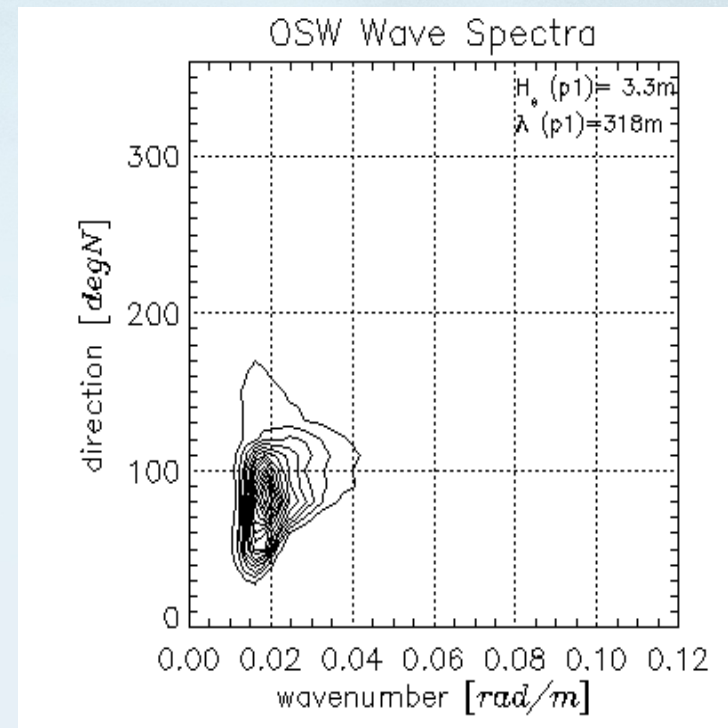
Example: ASAR WM processed with Sentinel-1 Algorithm

The Hurricane in North-Atlantic
captured by ASAR WM, 14Feb2011





Example: ASAR IM processed with Sentinel-1 Algorithm



Summary

- Based on the experiences with ASAR data, a new wave product is defined for Sentinel-1 Level 2.
- Some new features are introduced to improve/ease the use of the data
- The processing has been tested using ASAR WM and SM data
- Remaining issues:
 - Improve MTF
 - Adaption to TOPS

