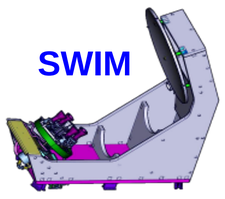
Wave imaging capabilities of the new rotating wave scatterometer SWIM onboard over open ocean and sea ice



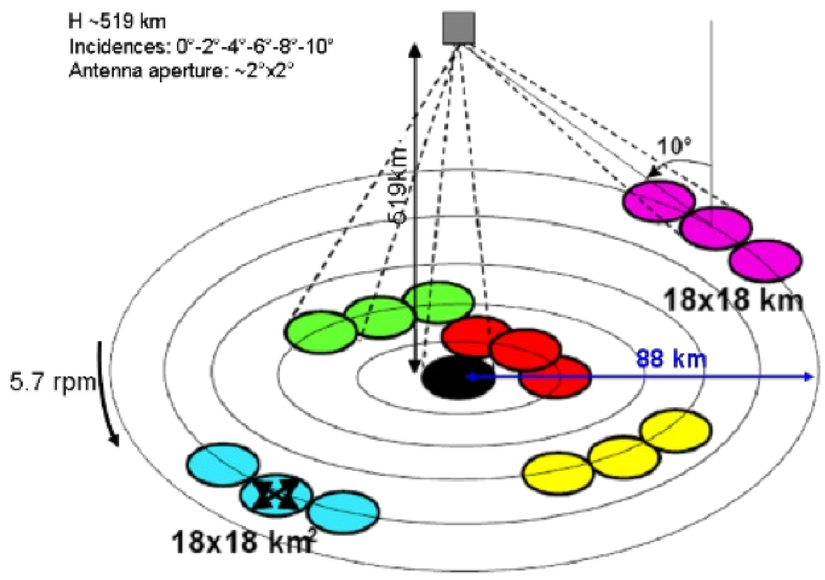
Collard F., Hauser D., Alraddawi D., Aouf L., Chapron B., Dalila M., Dalphinet A., Dufour C., Gouillon F., Grouazel A., Guitton G., Hermozo L., Husson R., Lachiver J-M, Lacrouts C., Mironov A., Nouguier F, Ollivier A., Perret B., Piras F., Rodriguez Suquet R., Schippers P., Tison C. , Tourain C, Pineau-Guillou L.

Launched Oct 29, 2018

CFOSAT: A China/France joint satellite oceanographic mission.

Joint measurements of surface wind and wave
- ✓a wind scatterometer (SCAT)
  => **ocean surface wind vector**
- ✓a wave scatterometer (SWIM)
  => **directional spectrum of ocean waves + wind and Hs from nadir**

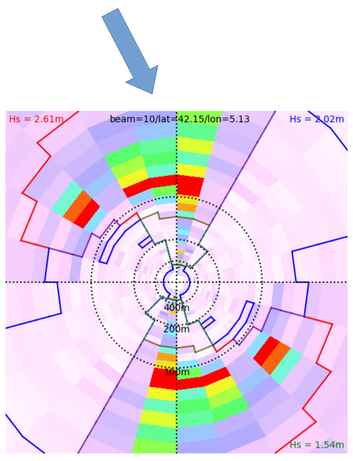
PIship : D. Hauser (LATMOS/CNRS), Liu Jianqiang (NSOAS)

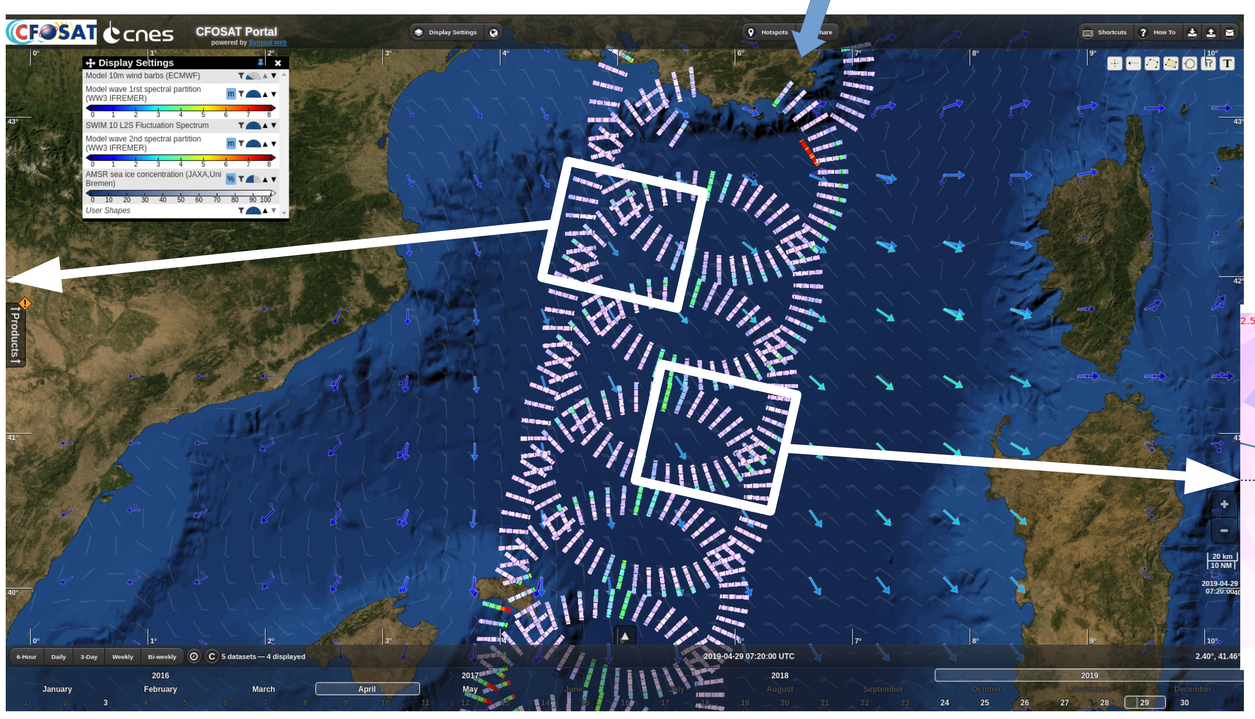


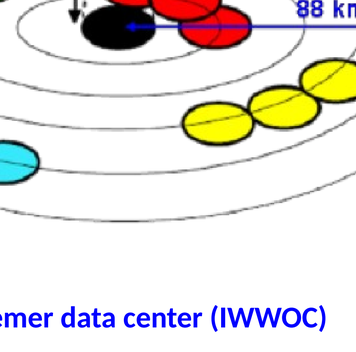
Main SWIM variables in the operational products

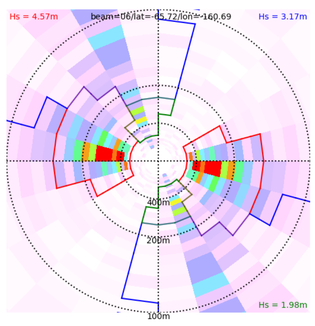
- 2D wave spectra for wavelengths in the range [70-500] m- with 180° ambiguity in direction

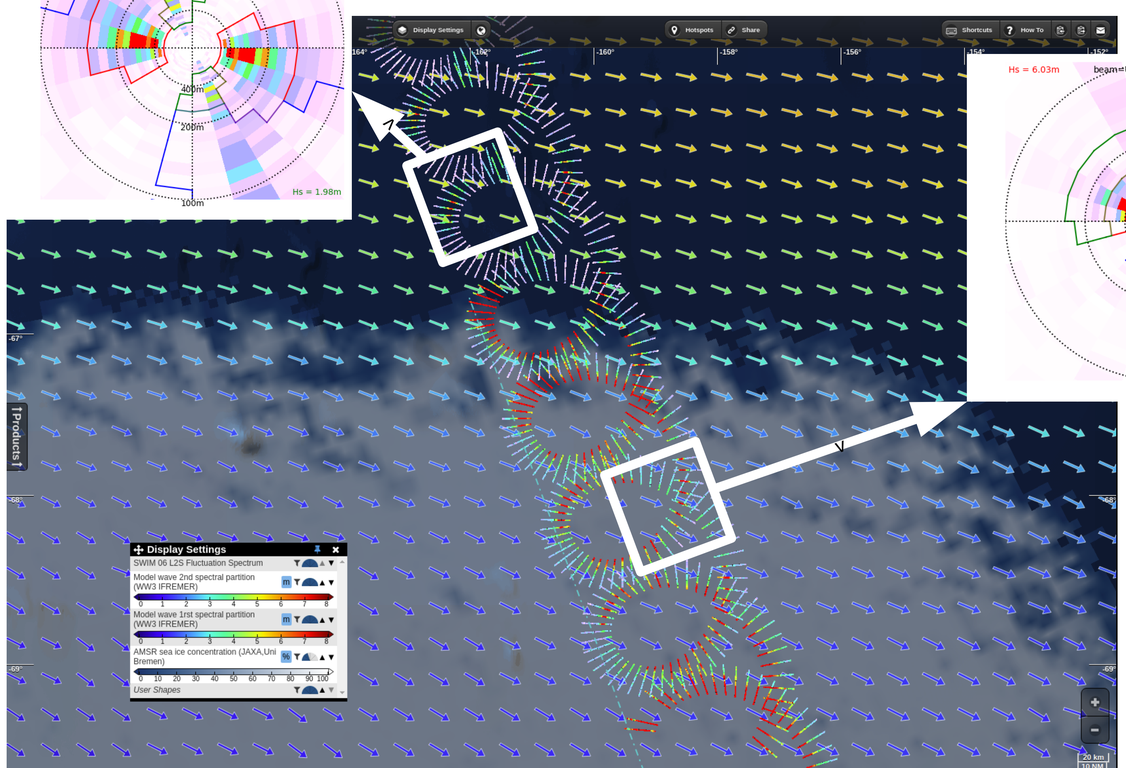
Alternative SWIM Ribbon products from the Ifremer data center (IWWOC)



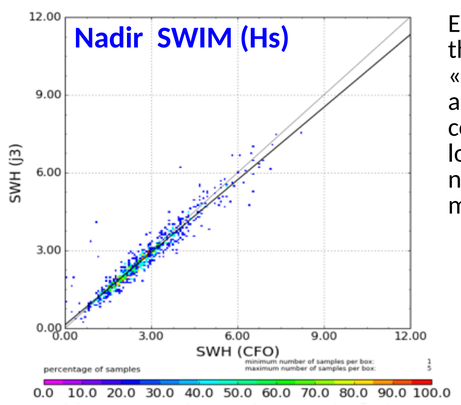








Hs_nadir_SWIM versus Hs Jason



Excellent performances thanks to a new « retracking » altimeter algorithm (“adaptive”) which compensates the relatively low repetition rate of the nadir sequences (5Hz) due to multi-incidence geometry

Conclusion

Already a great success for CFOSAT (launched only 1 year ago)

- **Very innovative mission, instrument and products**
- **Wave (Hs) and wind (U) products from nadir:** excellent quality,
- **Spectral data from off-nadir:** very promising (inversion method still in progress for noise mitigation)
  - ✓ consistent shape of 1D height or slope spectra, 2D spectra (in spite of temporary masking)
  - ✓ very promising for case studies at regional scale (fetch-limited, waves in current, waves under sea ice (not shown), waves generated by storms, hurricanes,..
  - ✓ work in progress to improve detailed performances (partition parameters) - currently perturbed by the non perfect correction of speckle noise (and masking)
  - ✓ => **Data access:** already available for science team, access enlarged through AVISO+ starting this fall (TBC) https://www.aviso.altimetry.fr/en/data/

NRT delivery to operational centers via Eumetcast (end 2019-beginning 2020)

With contributions from :