

Evaluation and exploitation of CryoSat ocean products for oceanographic studies

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Aims of this talk

- Routine CryoSat ocean products reporting
- Illustrate some examples of validation activity
 - Both routine and focussed



Calafat et al., 2017

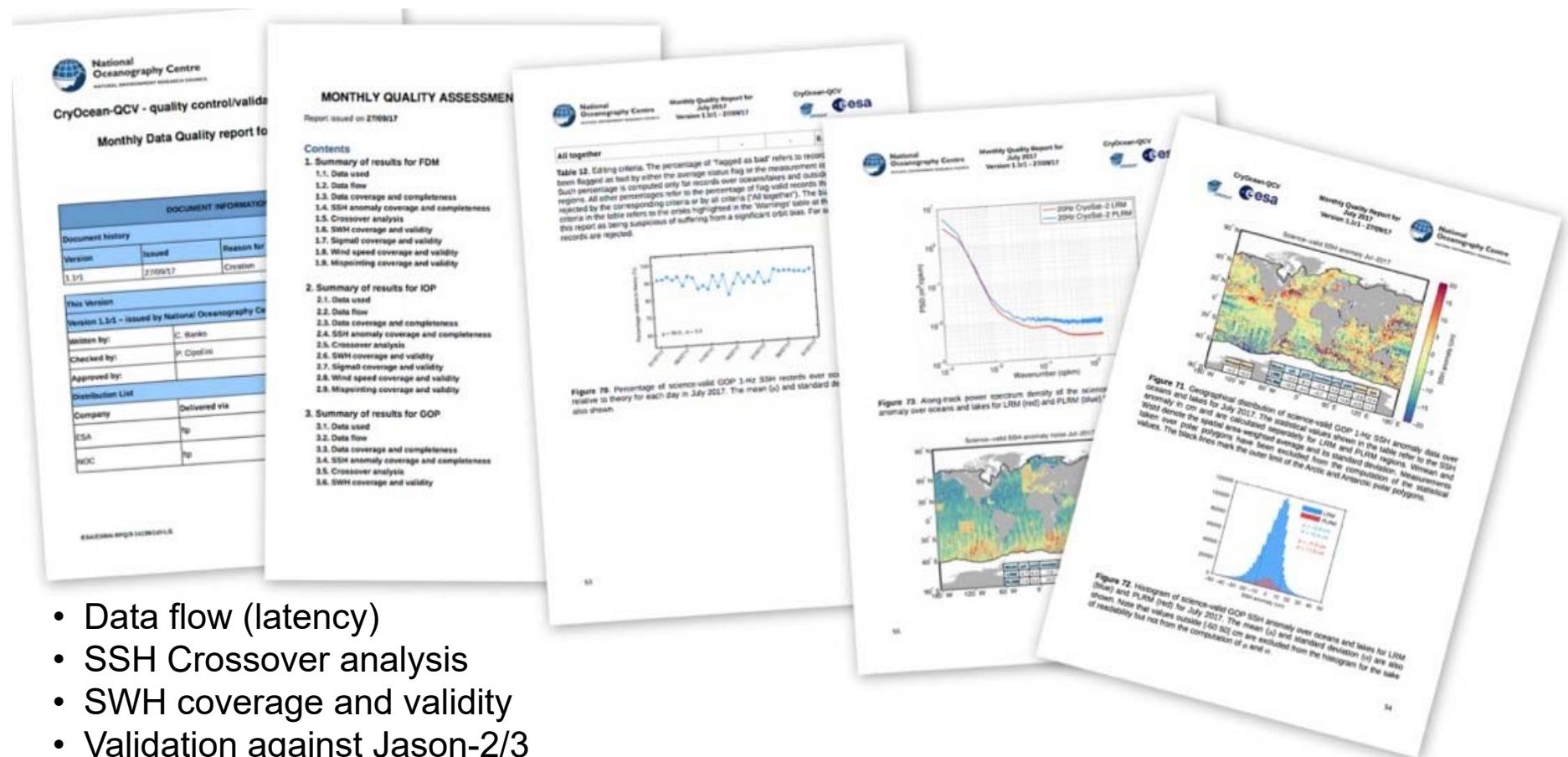


CryoSat ocean product quality status and future evolution

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Bouffard et al., 2018

Daily and monthly reports available



- Data flow (latency)
- SSH Crossover analysis
- SWH coverage and validity
- Validation against Jason-2/3
- Validation against in situ measurements and models

tide gauges, wind speed against buoy data, WaveWatch III model data, steric heights derived from T/S Argo profiles

<https://earth.esa.int/web/sppa/mission-performance/esa-missions/cryosat/quality-control-reports/ocean-product-quality-reports>

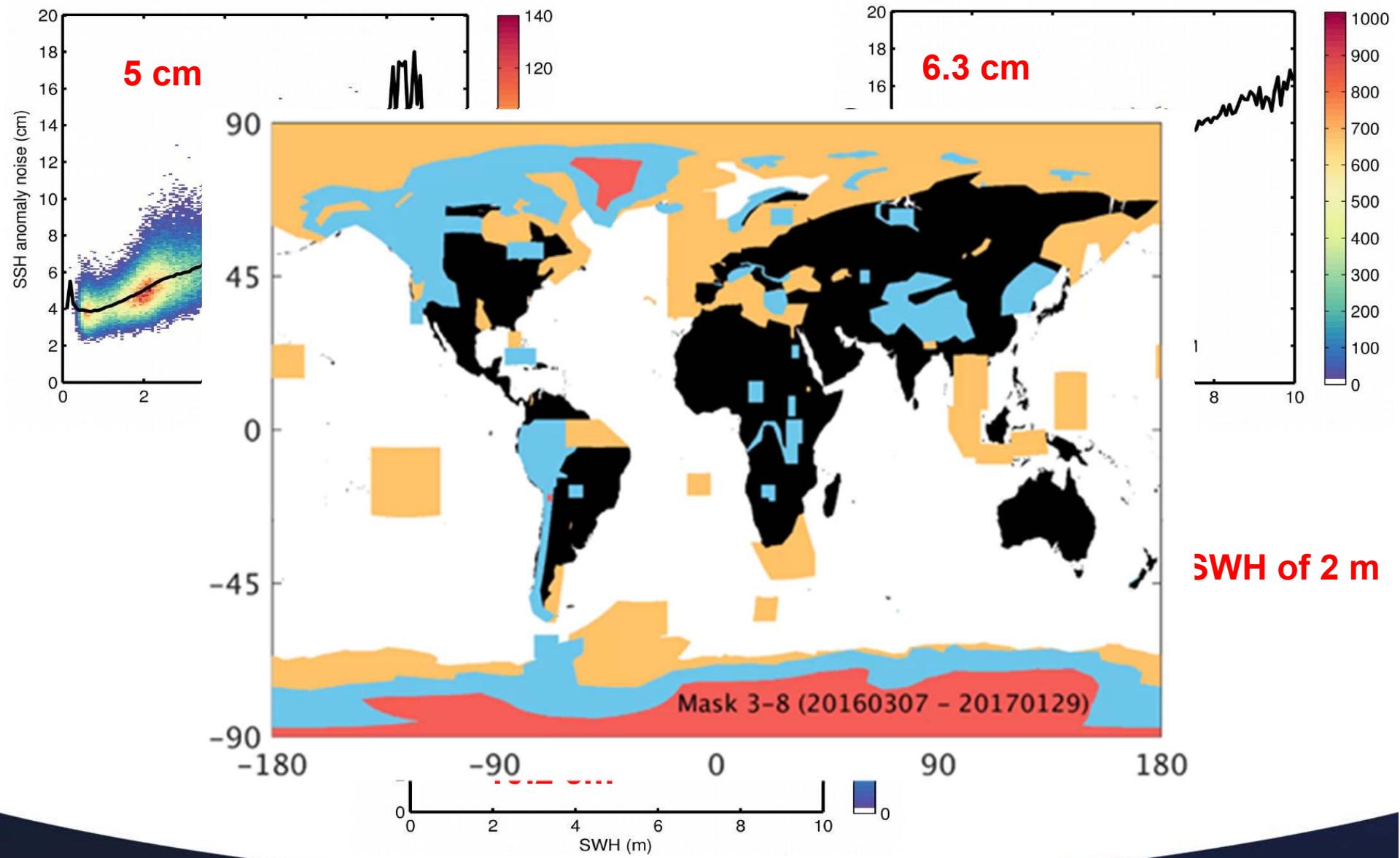


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Noise of altimetric SLA increases with sea state



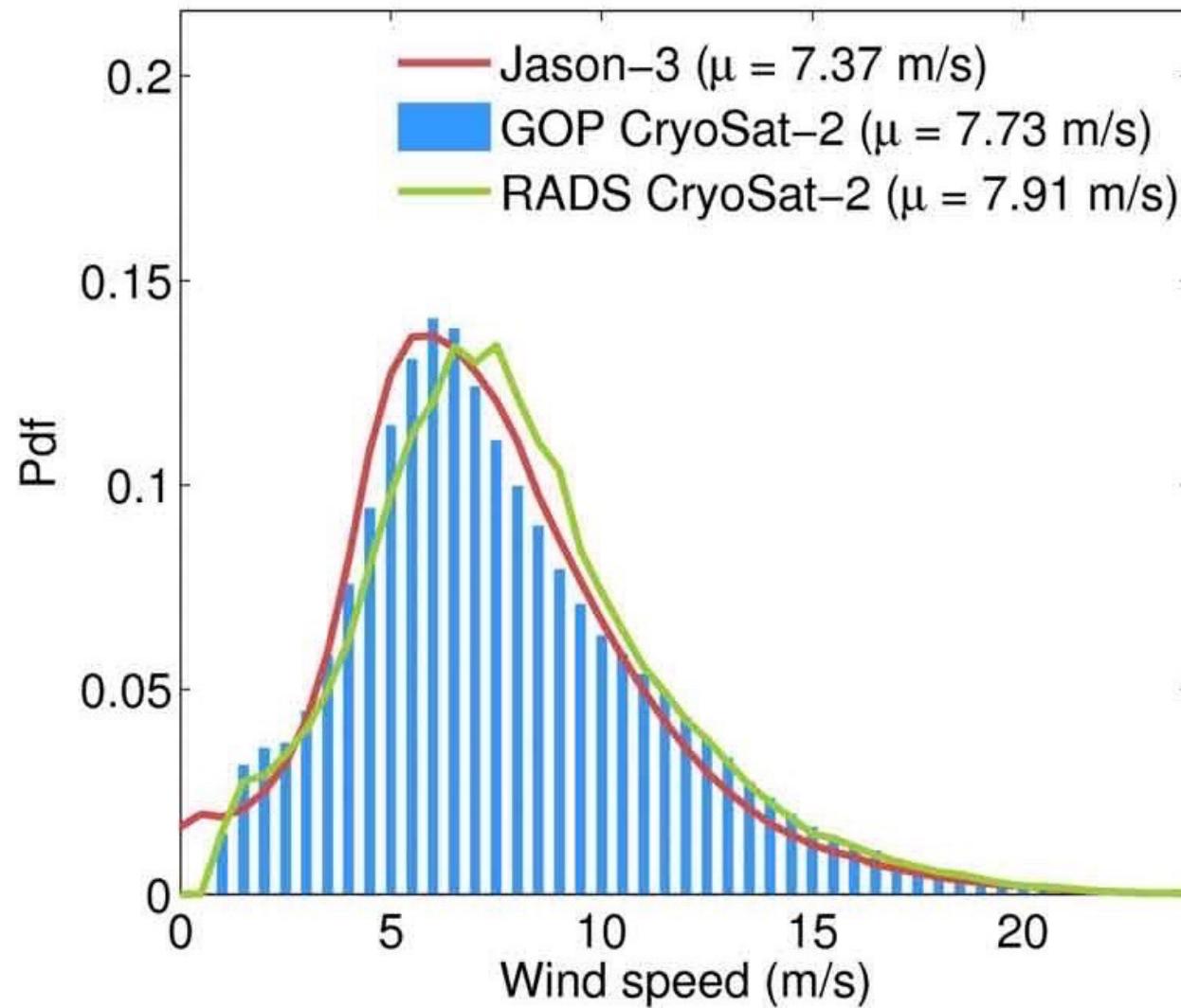
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Measuring global ocean winds with CryoSat

January 2019



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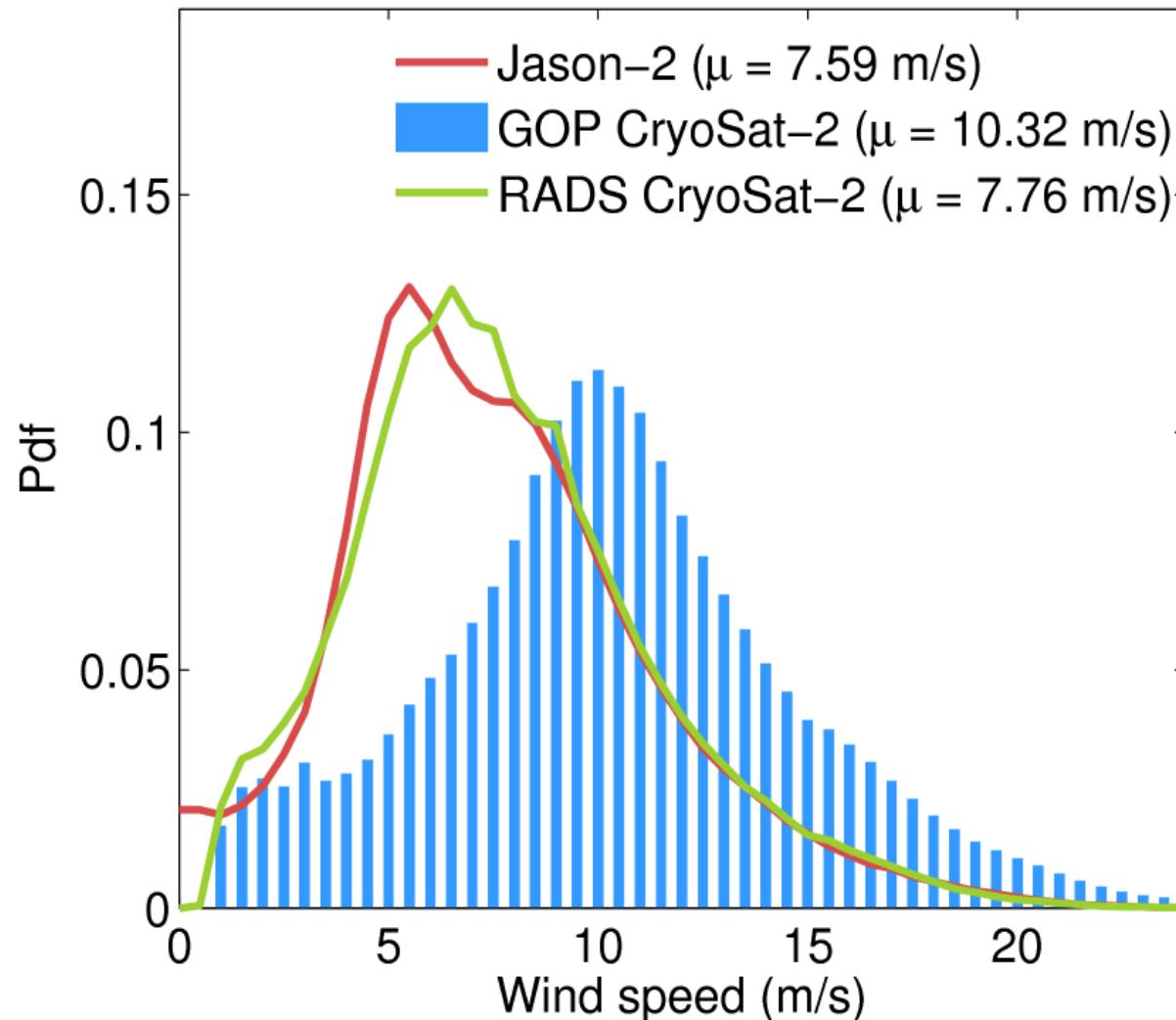
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Measuring global ocean winds with CryoSat

January 2016 BASELINE B



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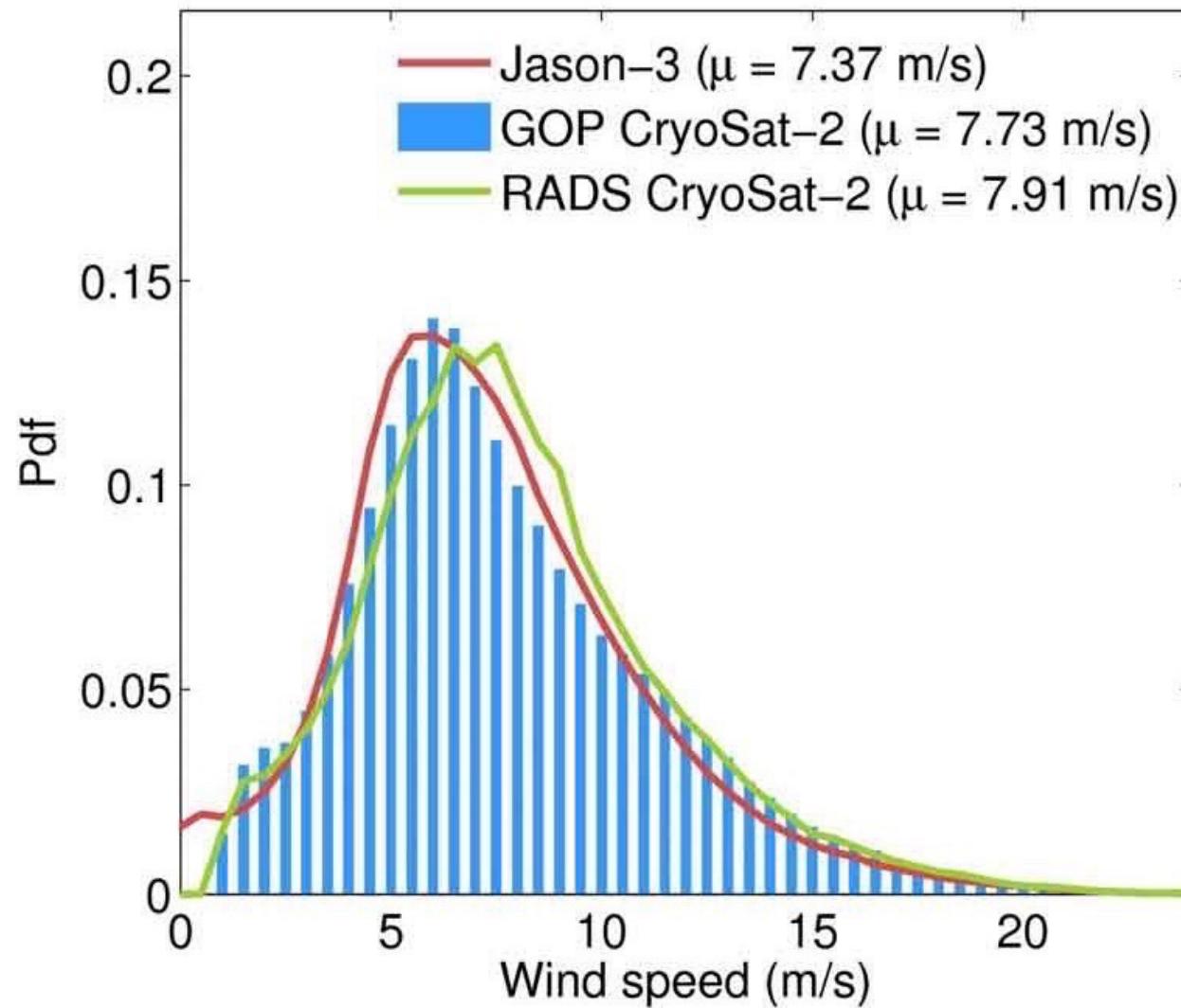
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Measuring global ocean winds with CryoSat

January 2019



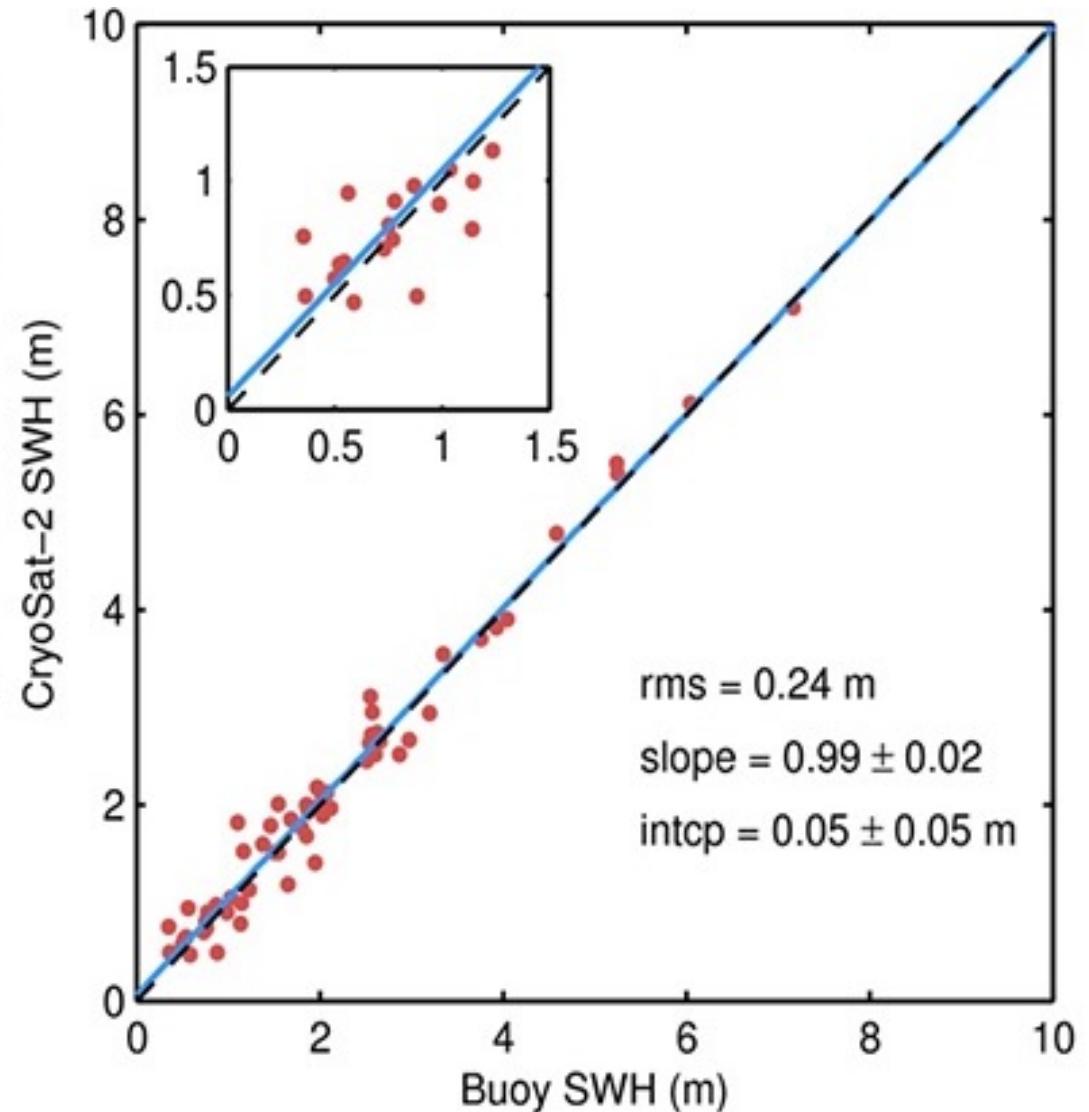
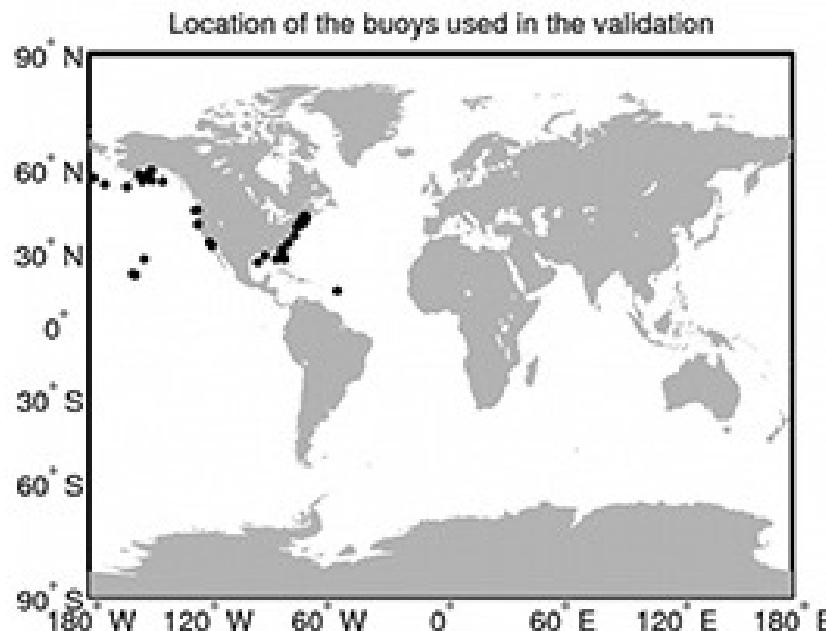
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Accurate global SWH - buoys

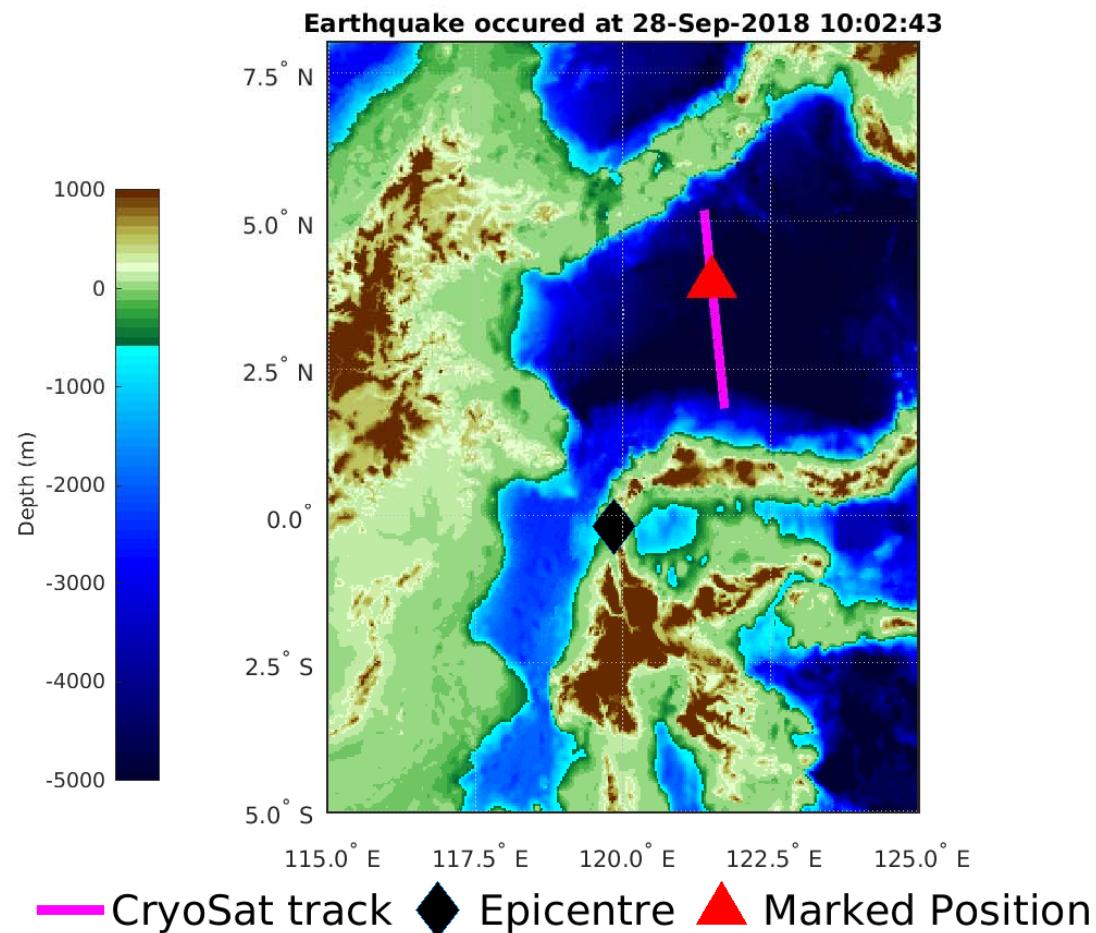


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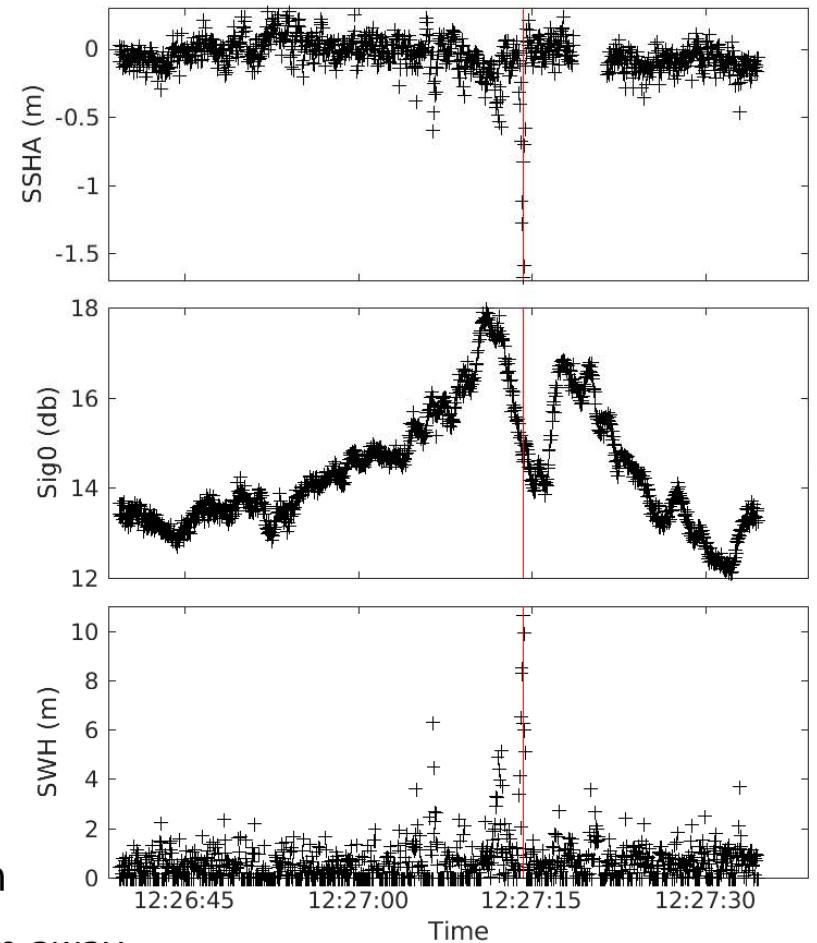
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Signal of devastating tsunami observed by CryoSat



Marked point is 2.4 hours after earthquake and 495.3 km away

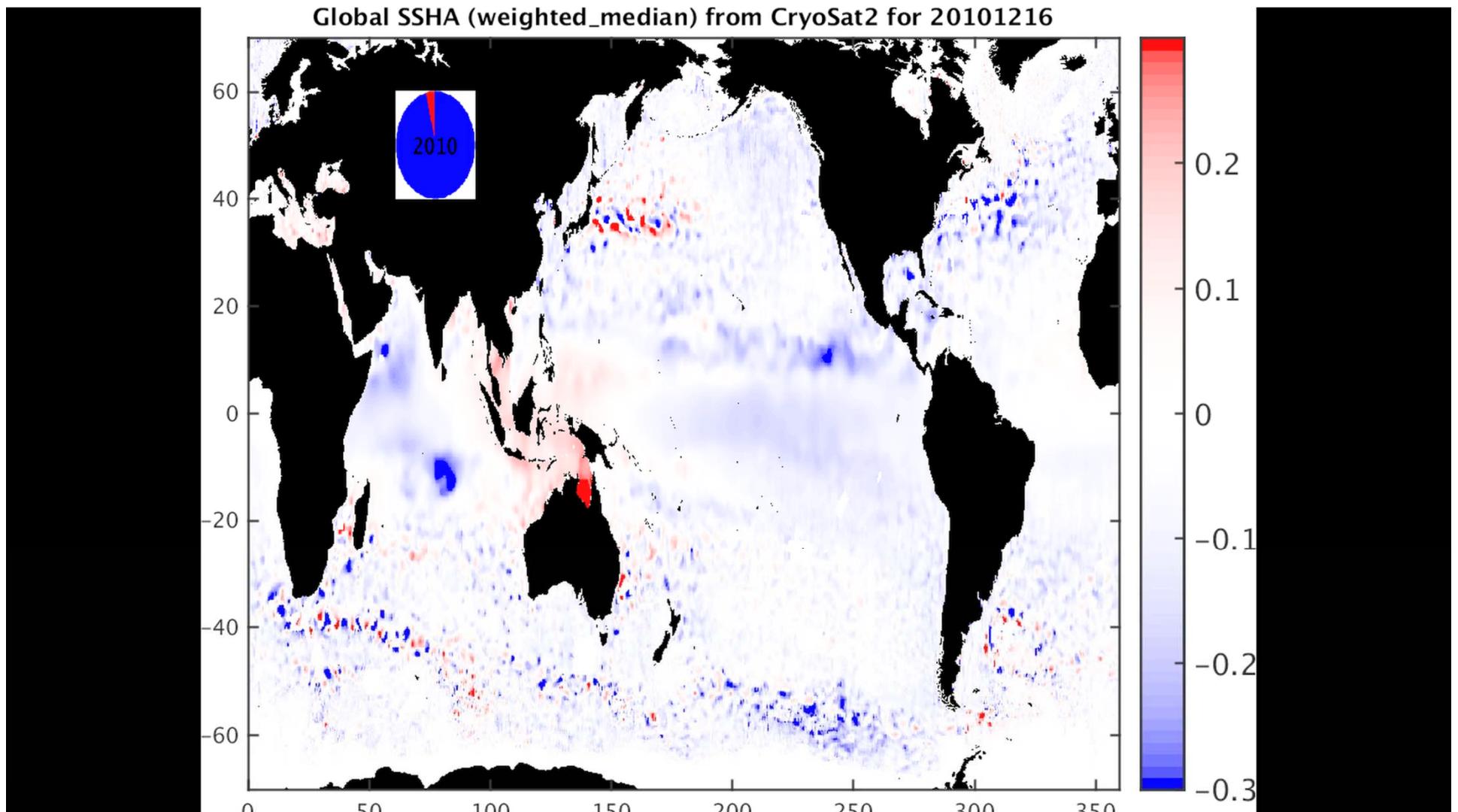


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Building a L3 SSHA Product



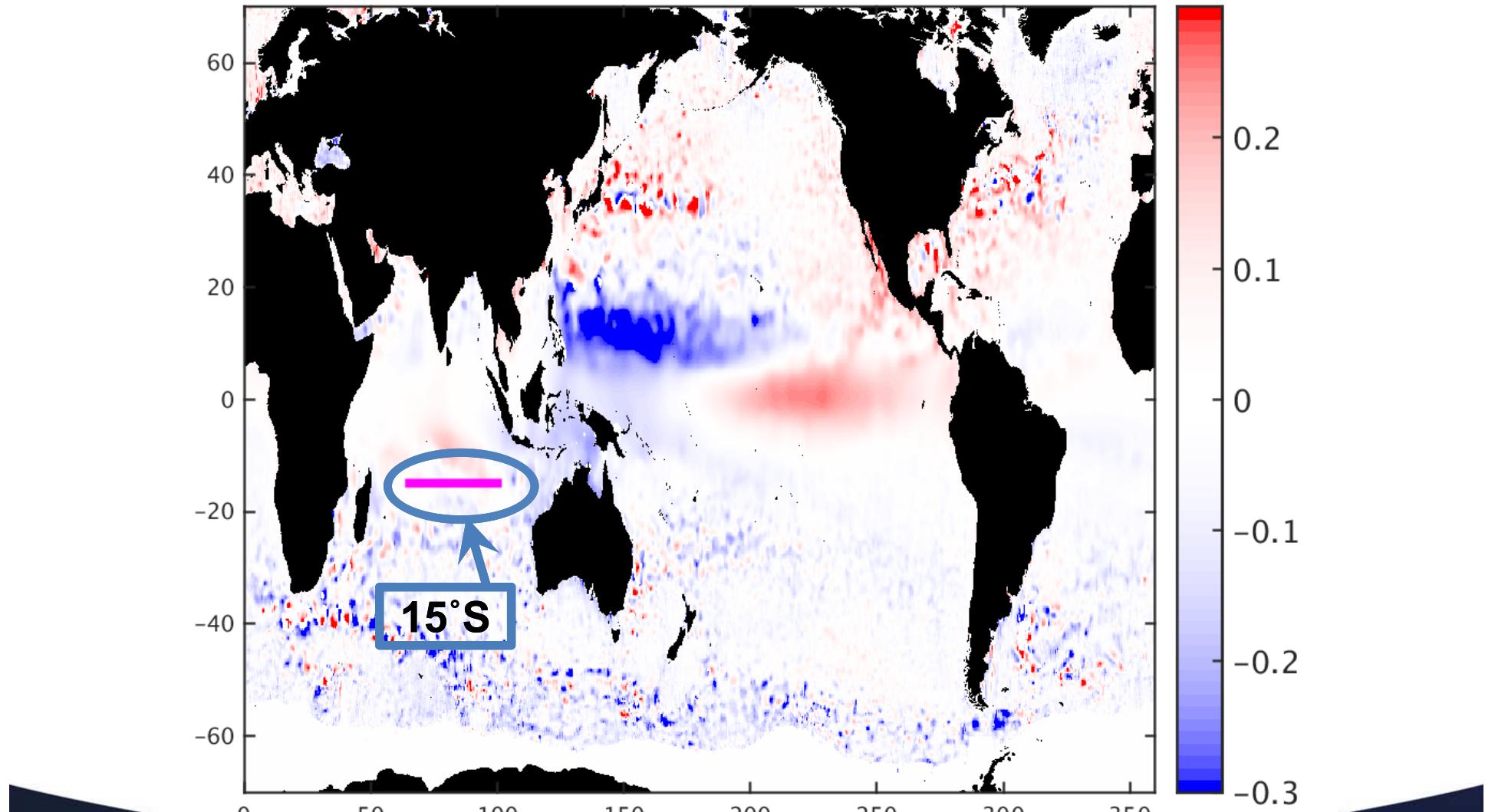
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Rossby Wave Study (65°–100°E)

Global SSHA (weighted_median) from CryoSat2 for 20151029



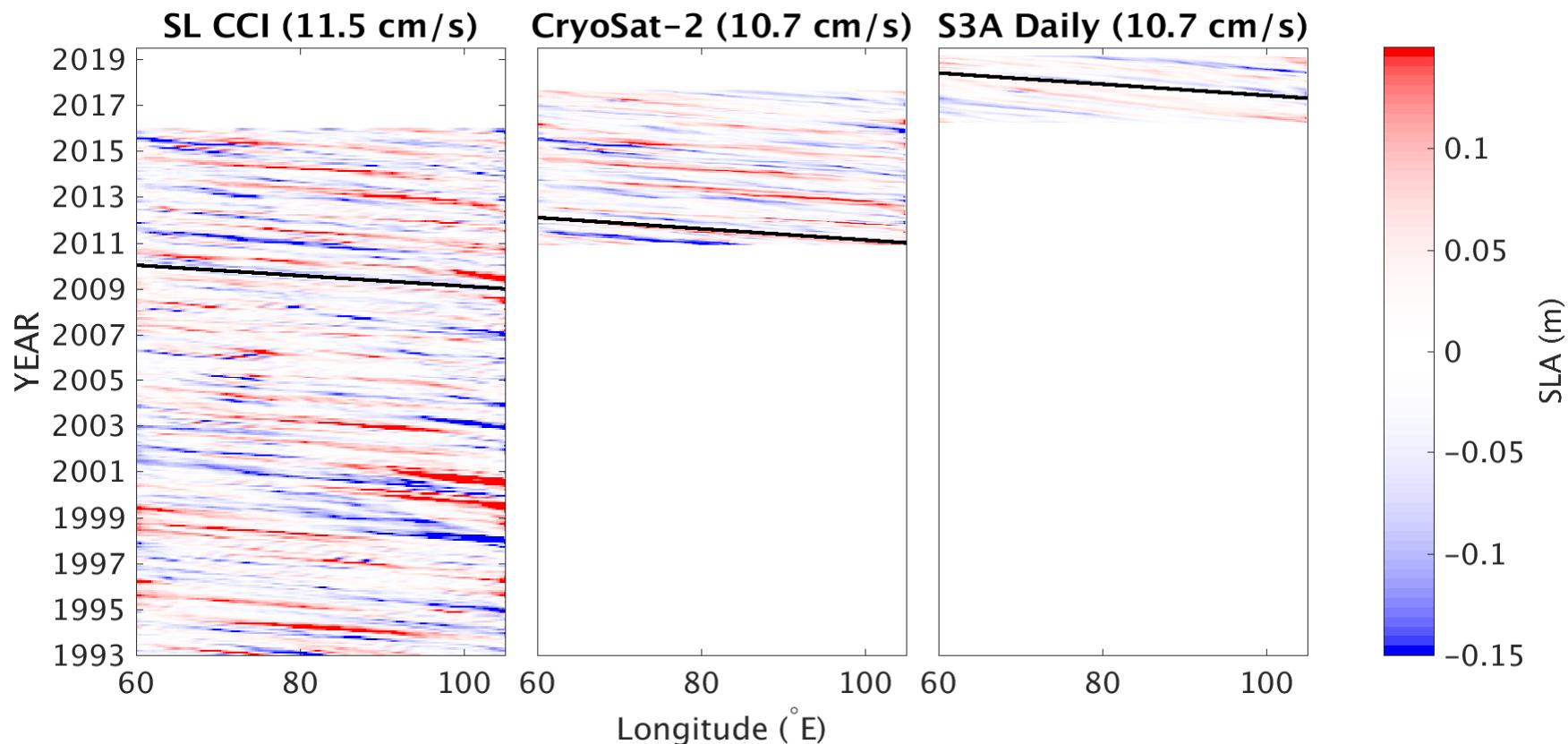
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Rossby Wave Study (65°–100°E)

15°S

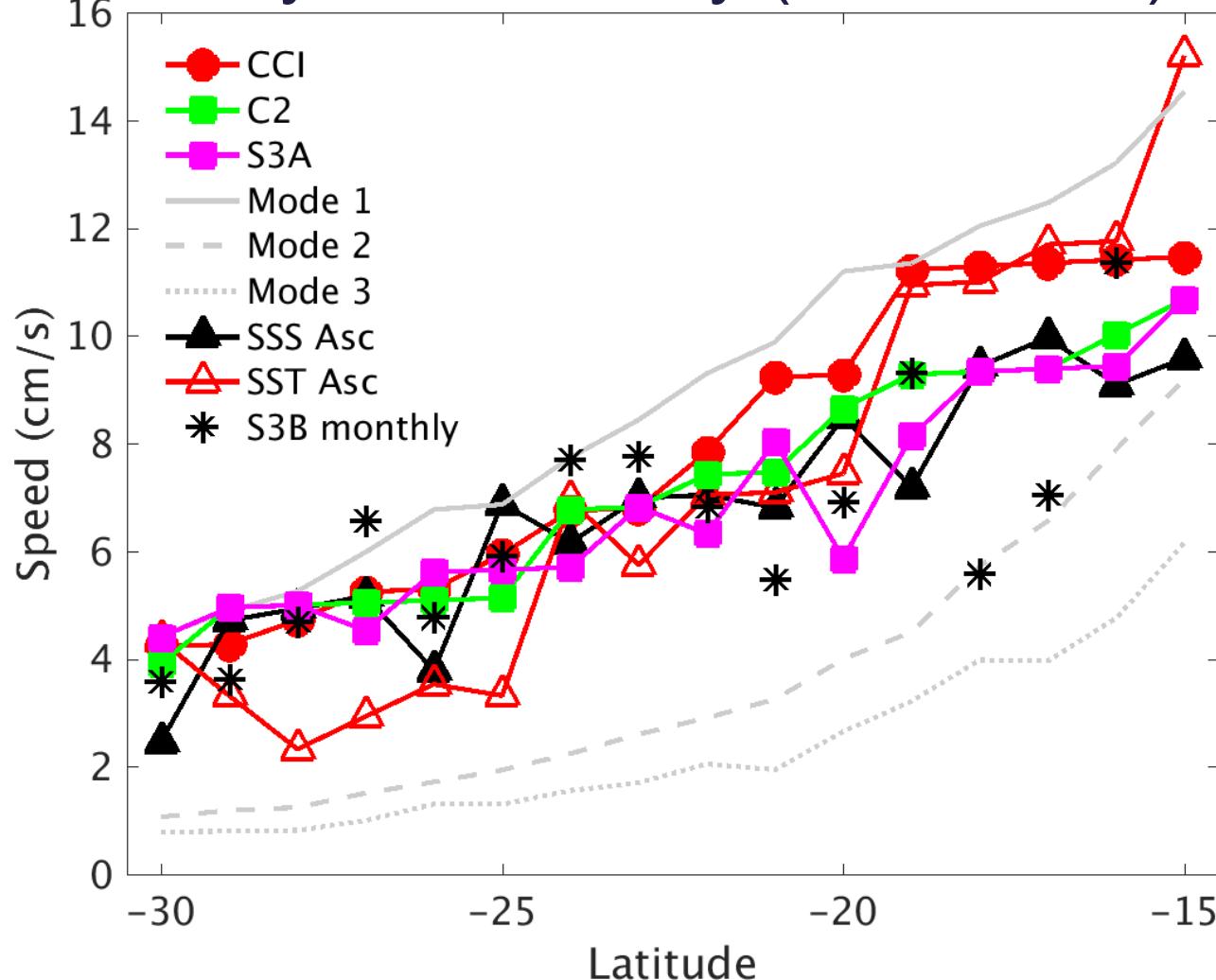


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Rossby Wave Study (65° – 100° E)



Propagation speeds derived using the Radon transform for the products given in the legend. The Mode 1–3 are the speeds calculated for the first 3 baroclinic modes using World Ocean Atlas 2013 data (2005–2012) as detailed in Banks *et al.* (2016).



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Summary

- CryoSat Ocean Products available operationally since April 2014 from ESA
then reprocessed from start of the mission (~9 years of data)
- Excellent performance over ocean
 - in terms of noise, compares well with TGs, ARGO, Jason products and other validation sources
- Operational change to Baseline C – including SAR and SARIn full dataset currently being reprocessed
- CryoSat Ocean products ready for oceanographic studies and applications
- **CryoSat Ocean Products complement the ocean altimetry record from repeat-orbit missions**



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THANK YOU



CRYOSAT 10th ANNIVERSARY SCIENCE CONFERENCE

20–23 April 2020 | Taormina, Italy

DEADLINES

- | | |
|------------------------------|------------------|
| • Abstract Submission Opens | 21 October 2019 |
| • Registration Opens | 4 November 2019 |
| • Abstract Submission Closes | 20 December 2019 |
| • Draft Programme | 17 February 2020 |
| • Registration Closes | 15 March 2020 |
| • Final Programme | 31 March 2020 |

www.cryosat10years.org



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