Take home messages from the 8th Coastal Altimetry Workshop

Paolo Cipollini, National Oceanography Centre, UK

Organizing committee: J. Benveniste (ESA), P. Cipollini (NOC), L. Miller (NOAA), N. Picot (CNES), H. Bonekamp (EUMETSAT), T. Strub (OSU), D. Vandemark (UNH), S. Vignudelli (CNR)

Session Chairs: O.B. Andersen (DTU), L. Bao (Chinese Acad. Sci), M. Cancet (Noveltis), J. Fernandes (U Porto), L.-L. Fu (JPL), J. Gómez-Enri (U Cadiz), J. Hausman (JPL), K. Ichikawa (Kyushu U), L. Fenoglio (TUD), A. Pascual (IMEDEA), R. Scharroo (EUMETSAT), T. Strub (OSU), P. Thibaut (CLS) J. Wilkin (Rutgers U), A. Uematsu (JAXA), D. Vandemark (UNH), S. Vignudelli (CNR)

plus the many scientists who contributed papers, posters & animated discussions

The quality of coastal altimetry continues to improve

This challenges our understanding of the ocean at short scales

Technical advances

- Knowledge on how to handle SAR altimetry is rapidly expanding
  - stacking, improved waveform models
- CryoSat-2 SARM working very well and ideal precursor to Sentinel-3
- AltiKa also extremely good in coastal zone
- Envisat Individual Echoes great testbed for new and future missions

SAR Altimetry Training Course, 21-22 Oct

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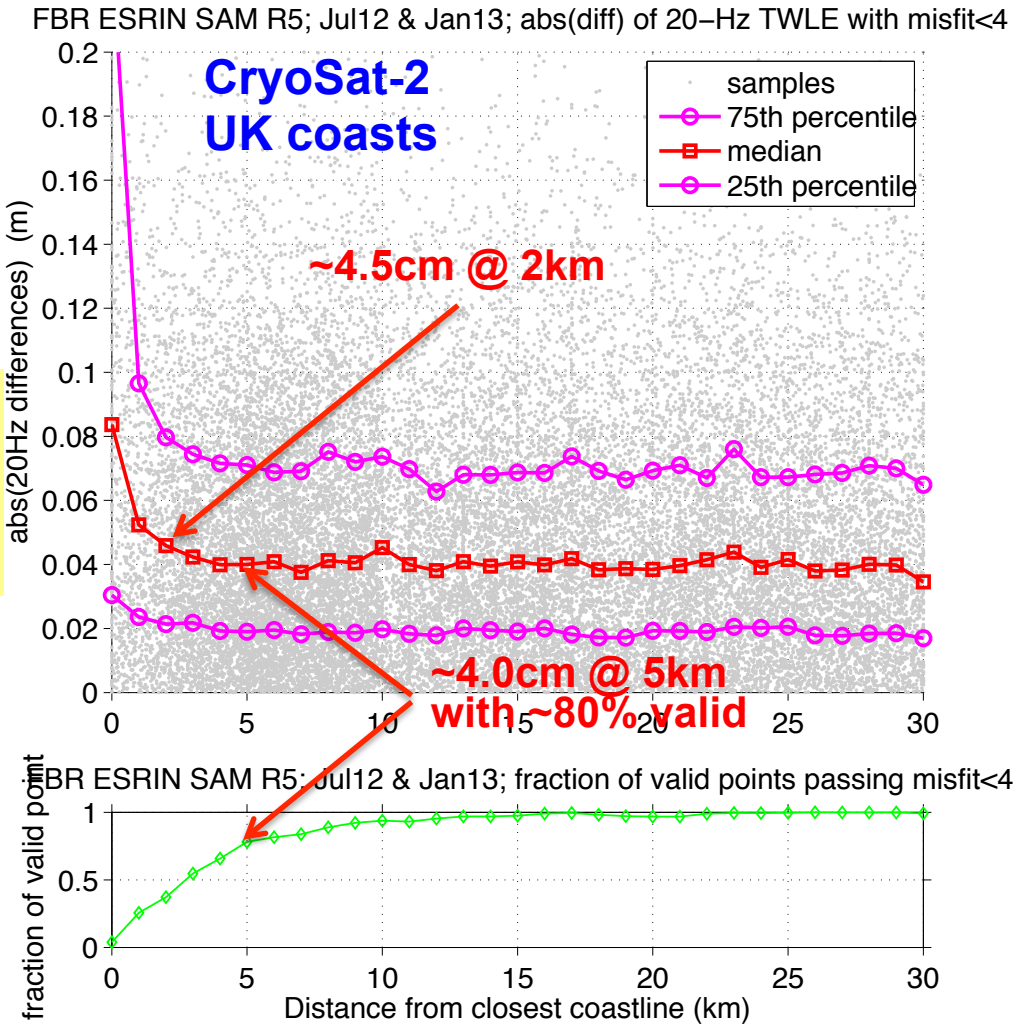

CP4O Team

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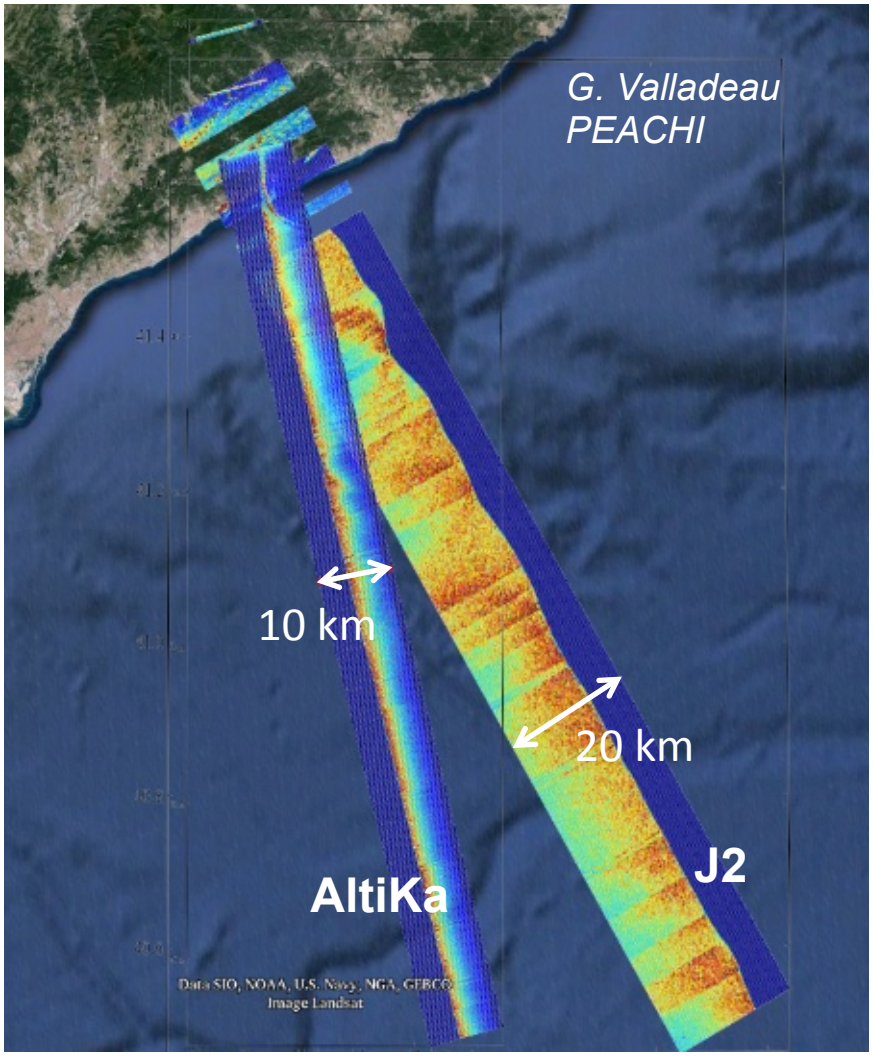
AltiKa / Jason-2 West Mediterranean Sea



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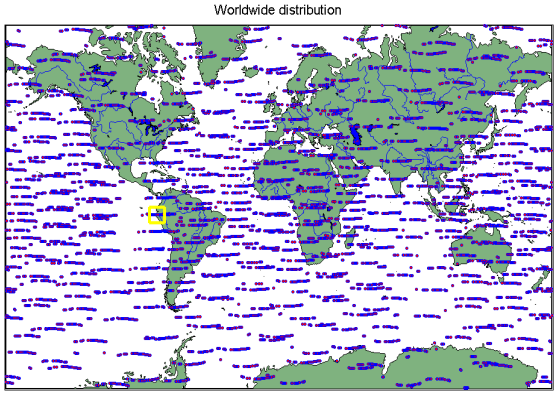
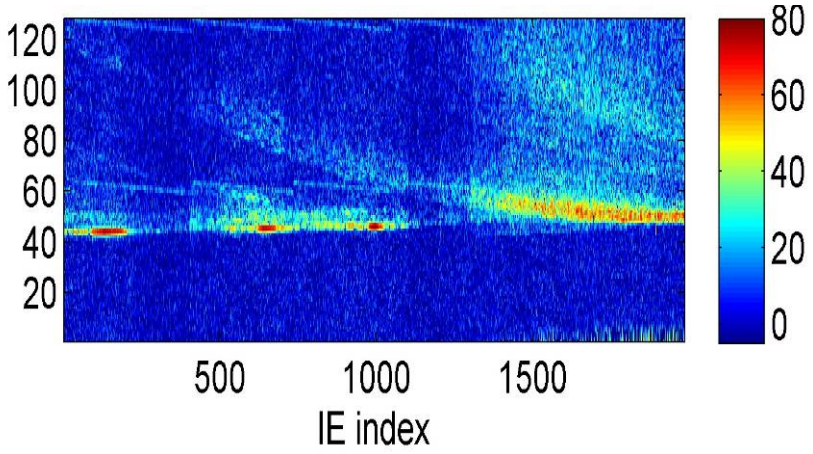


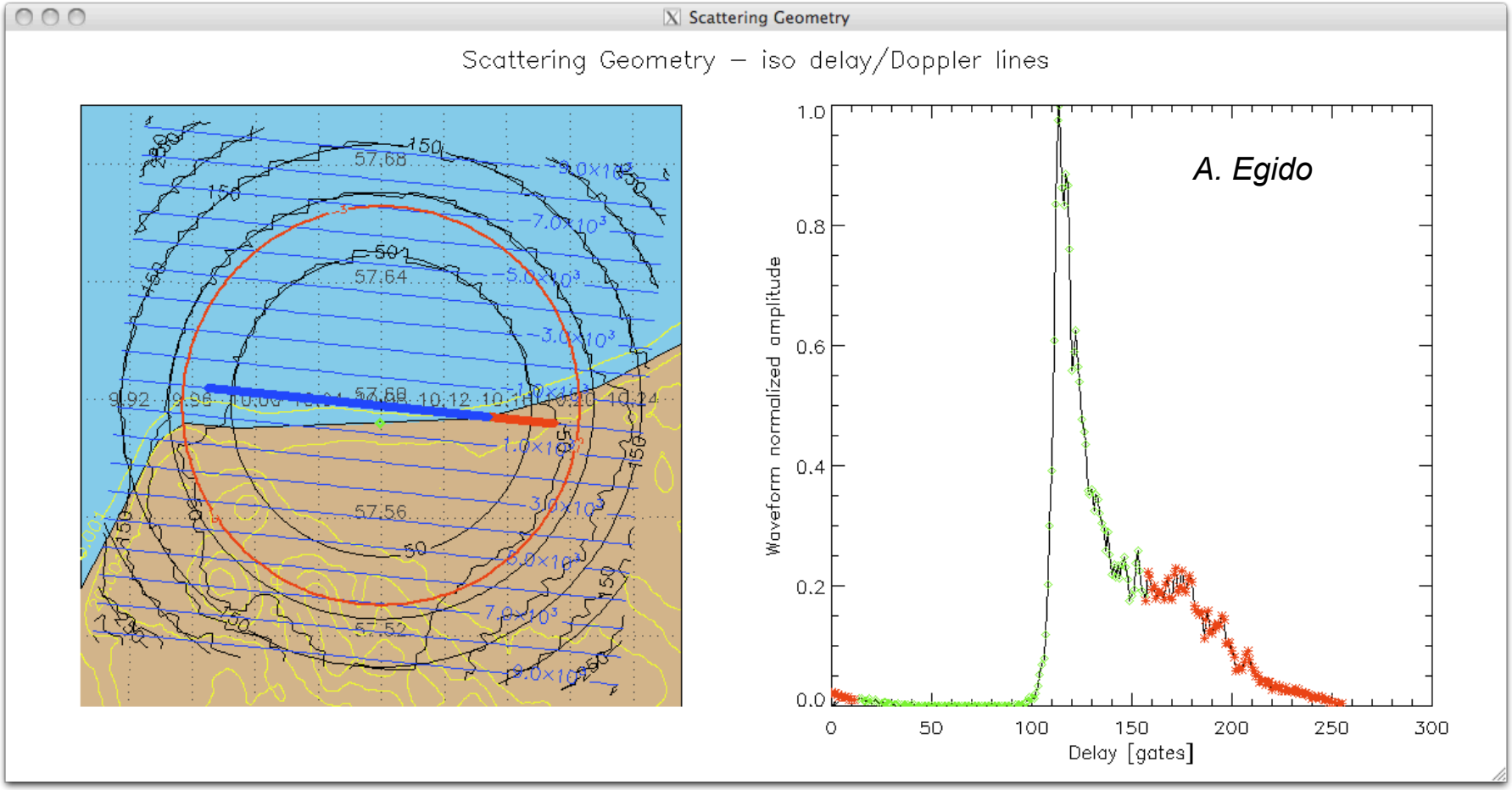


1-second of of 1800 Hz echoes in vicinity of Rio Tigre, Peru; Amplitude in dB re noise

R. Abileah

Technical advances

- Avoiding land effects with range gate selection



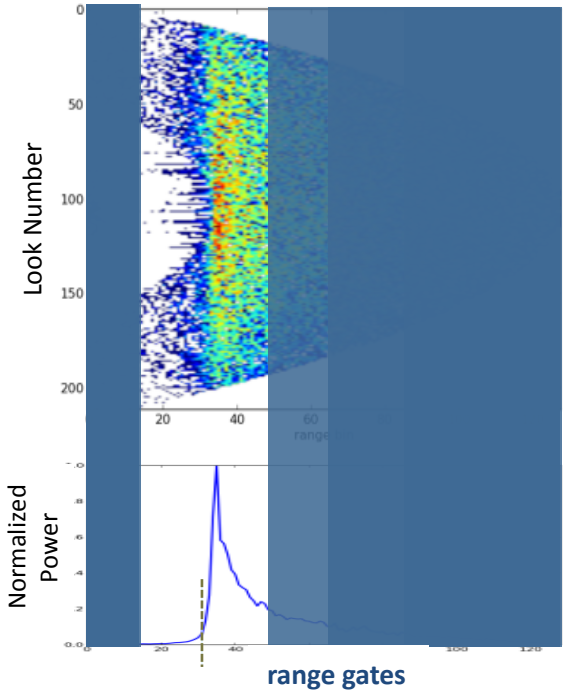
Technical advances

- Avoiding land effects with range gate selection
- Improvement in retrackers
  - windowing/subwaveforms
- Work on inland waters remains very relevant and promotes better understanding

SAR Mode

Stack of echos (after migration)

Multilooked echo



P. Thibaut

12 . 33 . 48

Window Truncation	12-115	12-83	12-63	12-48
Radius of the WF footprint	7488 m	5848 m	4530 m	3203 m

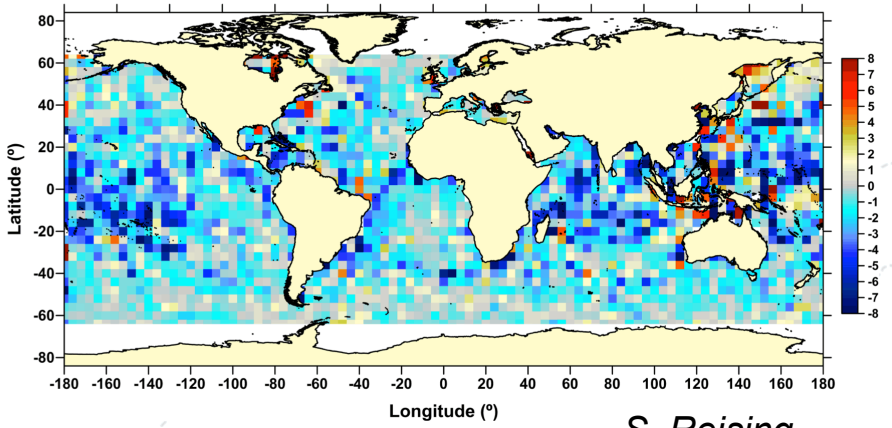
Continuing improvement in corrections

- DComb Wet Tropo
- High-res MWR on the horizon
- MSS – and tides!!
  - in coastal regions data editing for MSS determination is critical
  - SarIN! Example
- Significant differences shown between the GDR-Global DAC prediction and local models within several regions.
  - do not apply the global DAC to the altimeter SSHA, or do so after evaluation against wind-forced HF signals along your coastline.

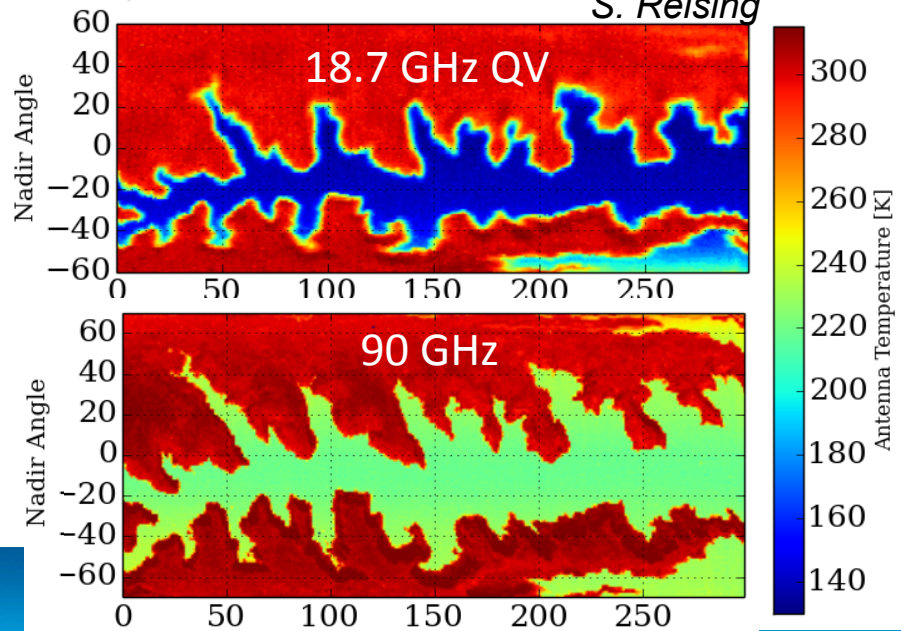
Variance difference at Xovers: DComb-ECMWF

SLA variance difference at crossovers (cm2) between **DComb and ECMWF Operational Model.**

J. Fernandes



S. Reising



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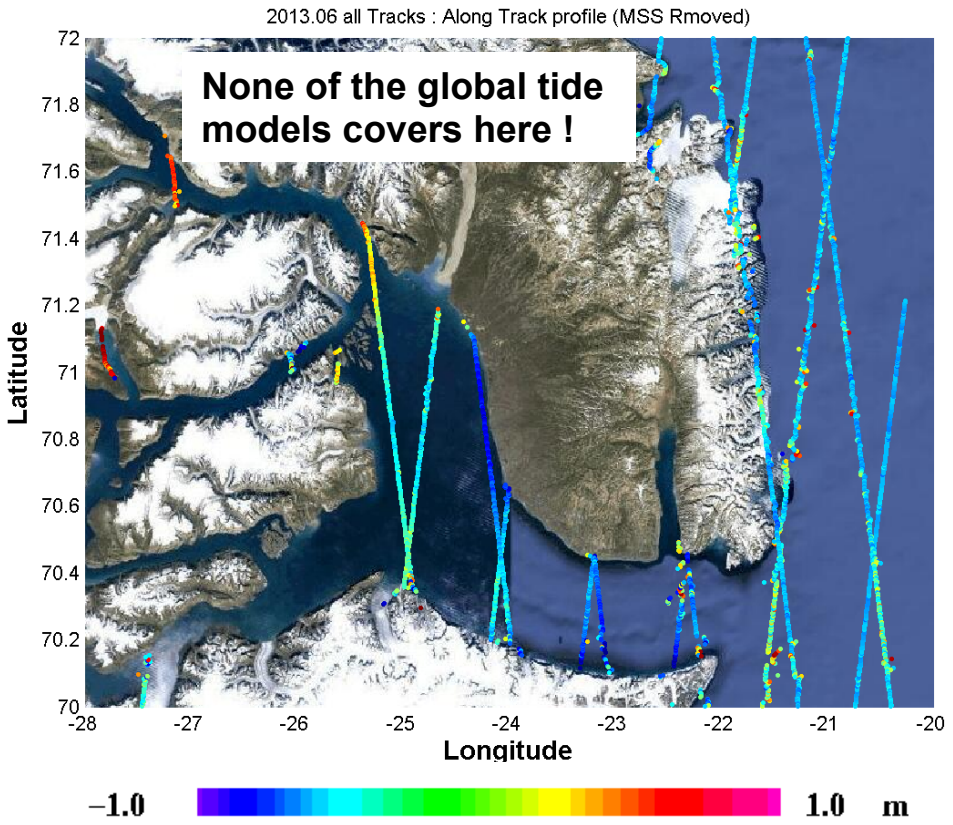

O. Andersen

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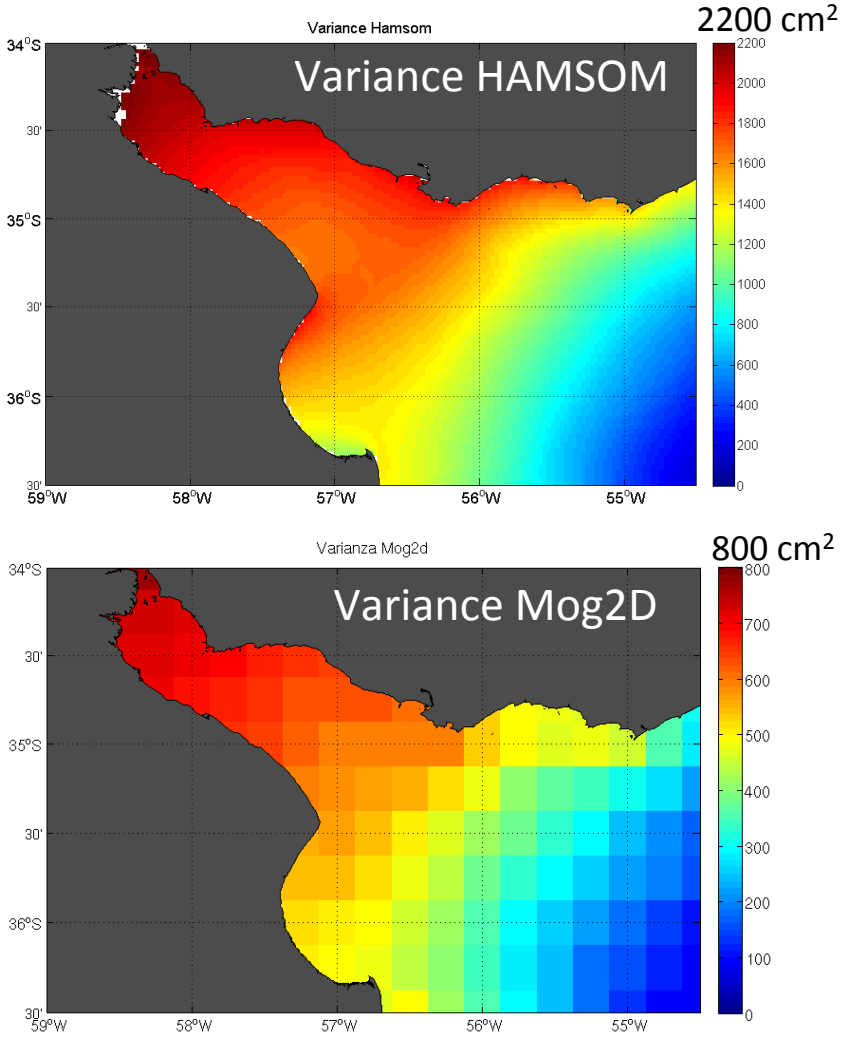


L Ruiz-Etcheverry

CAW-8 Recommendations

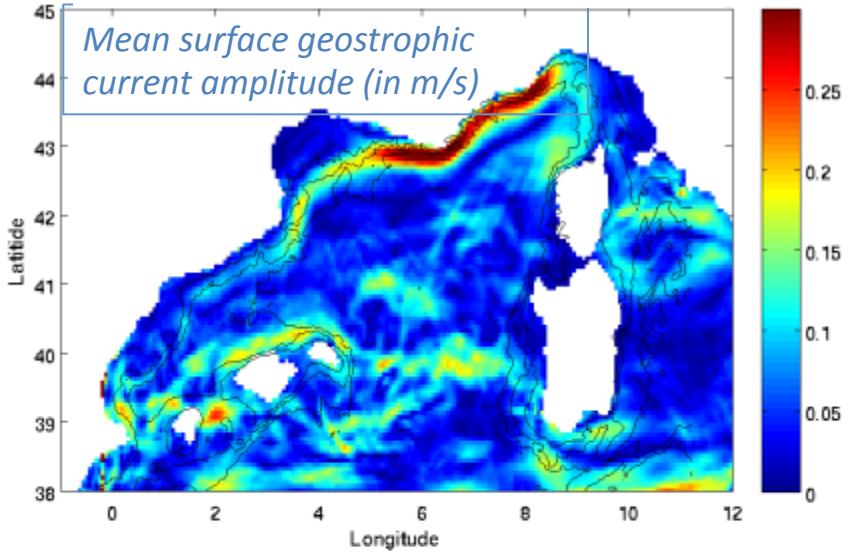
To Agencies and data providers

- [CAW8-REC1] **Unfiltered along-track high-resolution SSH** should be open to public in both delayed and NRT products
  - Best filtering scales may differ regionally and seasonally
- [CAW8-REC2] A **Coastal MSS and MDT** recomputed with high-resolution SSH would be a useful thing
  - For understanding dynamics
  - For cal/val with non-repeating tracks (although less accurate than in repeating orbits)
- [CAW8-REC3] support R&D in development of **more accurate tidal models in the coast** (including merging regional models with global ones)

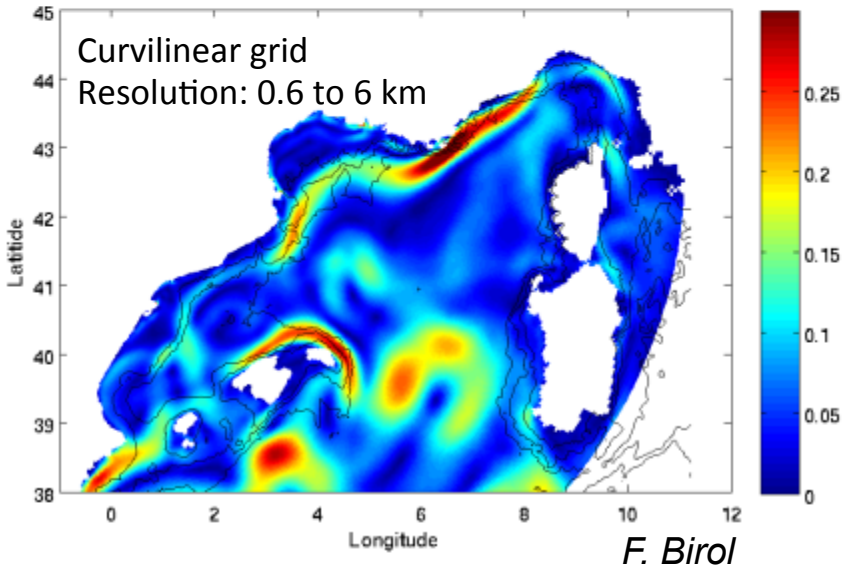
Cal/Val and Applications

- 30+ contributions
- from broad shelf to the coast
- strong complementarity with models

Observations (MDT Rio 2014)



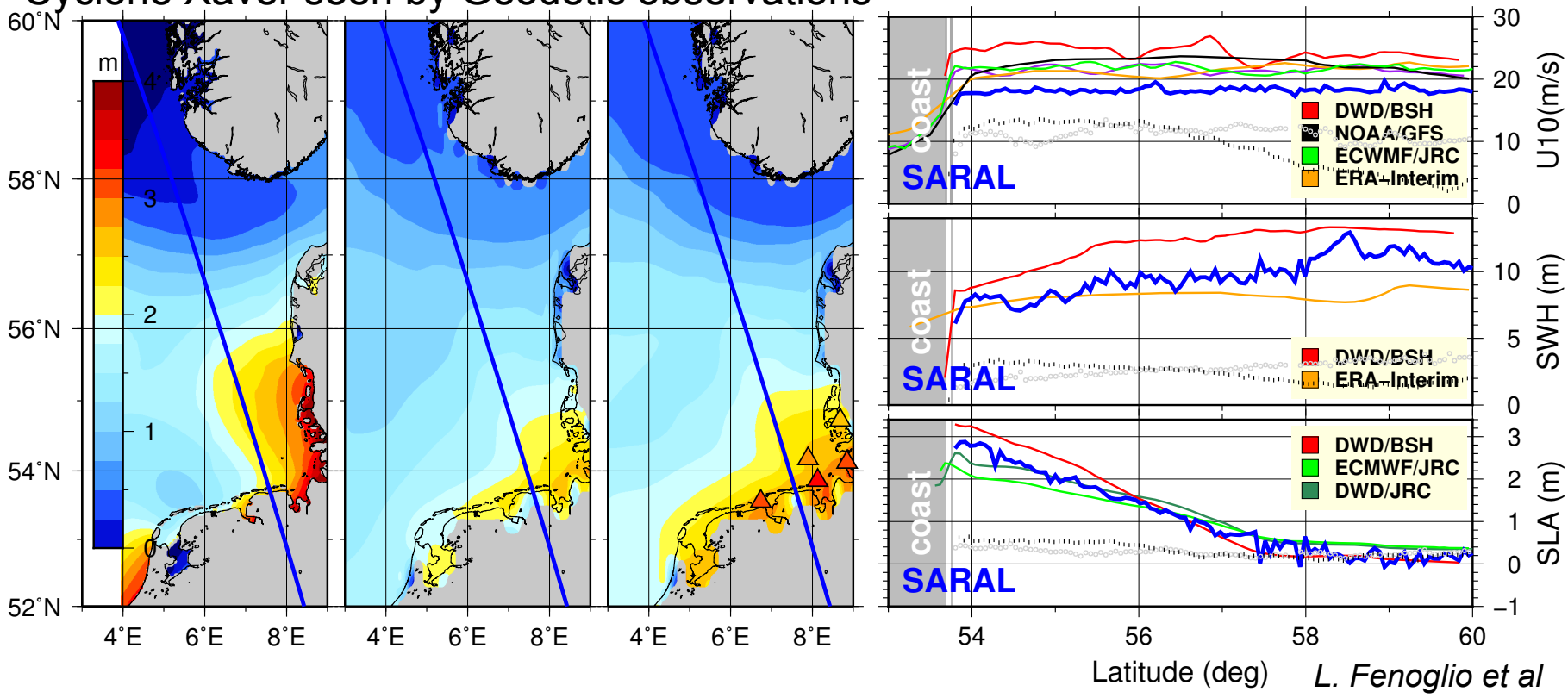
Symphonie model (regional config in 2014)



F. Birol

Application example 1: storm surges

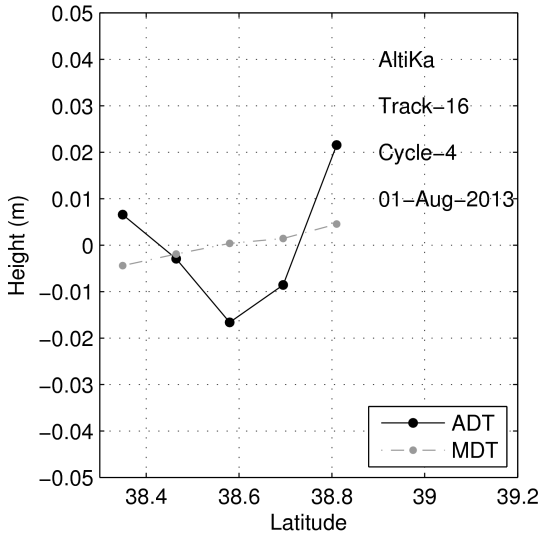
Cyclone Xaver seen by Geodetic observations

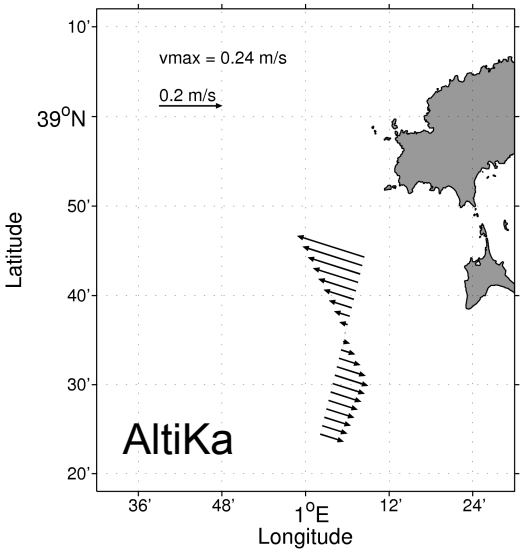


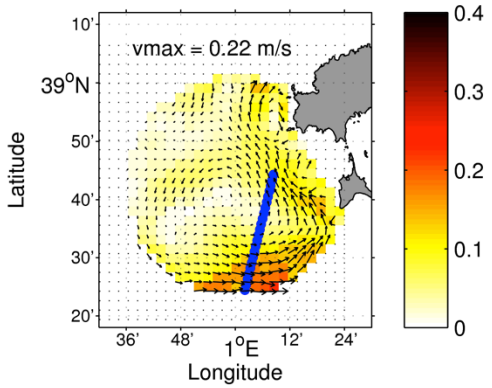
L. Fenoglio et al

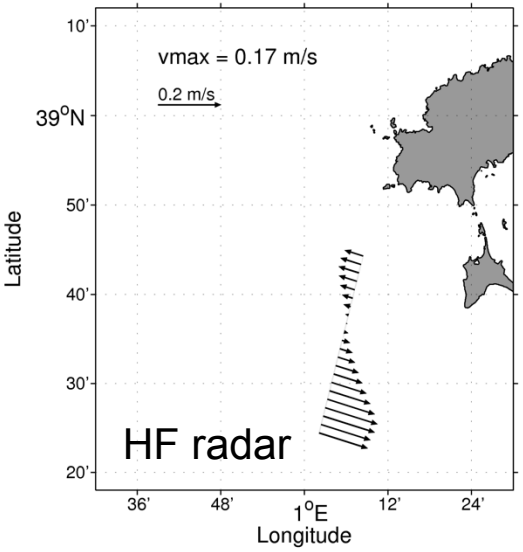
Present constellation insufficient to reliably capturing all surges, but the time/ space information content can be extended using model dynamics (example: statistically altimetry/tide gauge blending by DMI)

Application example 2: coastal dynamics









Example at Ibiza, W Med: SARAL/AltiKa derived velocities reveal coherent mesoscale features with general good agreement with HF radar fields

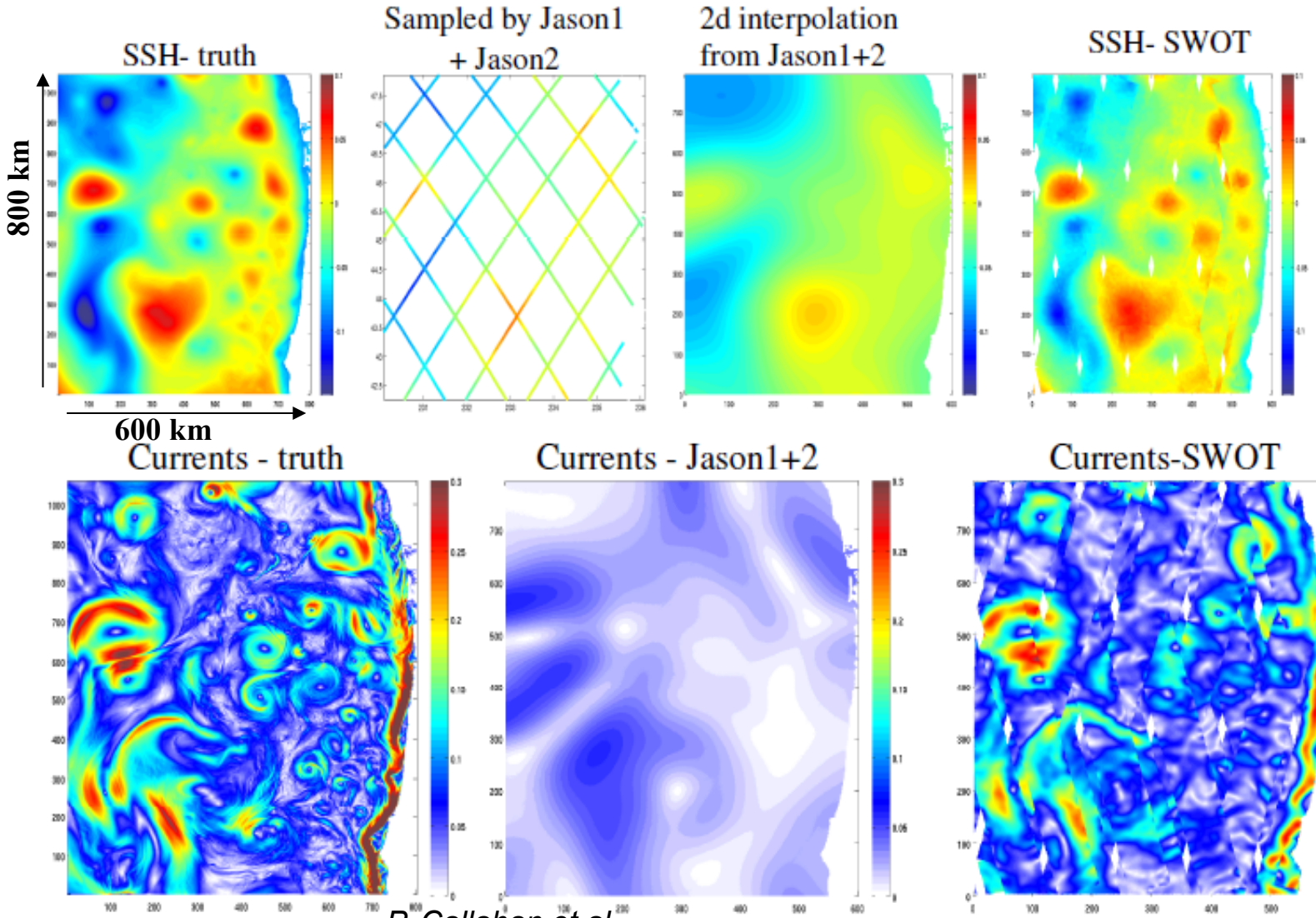
A. Pascual et al

The Challenge, again

- The quality of coastal altimetry – **precision and resolution** – continues to improve, challenging our understanding of the ocean at short scales
- how do we manage the extra resolution?
  - recognize that these features are not geostrophic
  - links to submesoscale features are responsible for much of the ocean energy; and mixing
  - The high resolution will help to derive high resolution bathymetry
  - River outflows, estuary circulation and ocean-estuary interactions will be better mapped

Relevance to SWOT

US West Coast



P. Callahan et al

*Proposed Mission – Pre-decisional – for planning & discussion purposes only

Relevance to GODAE OceanView

- GOV COSS-TT (Coastal and Shelf Seas Task Team)
  - John Wilkin representing CAW
- Need **COSS-TT/CAW joint meeting** to promote uptake of Coastal Altimetry and expose issues for SWOT etc.
- Need **COSS-TT/CAW/OST-hydrology joint meeting** to target river discharge & coastal wetlands for land-estuary ocean interaction


600 years ago…..
Council of Constance,
1414-1418

National Oceanography Centre · cnes · NOAA · EUMETSAT · NASA · OSU Oregon State University · University of New Hampshire · esa

60 Abstracts, 29 Posters, 26 Talks + 1 Keynote by K. Raney
7 dedicated sessions, 80 participants from 19 countries
All material available on www.coastalt.eu/community

Yet another successful 'Council' of Coastal Altimetry

8th COASTAL ALTIMETRY WORKSHOP 23–24 October 2014 | Lake Constance | Germany