Coastal Altimetry Session Summary

Chairs: Mathilde Cancet and Ted Strub

(Florence Birol and Marcello Passaro helped shape the session)

- 5 oral presentations
- 6 posters

Main topics:

- Coastal altimetry products creation and validation
- Applications to regional coastal circulation and sea level rise
- Altimetry/tide gauge/model comparisons

A large variety of study areas:

- North-East Atlantic, North Sea, Baltic Sea
- Mediterranean Sea
- Patagonian Shelf
- South Atlantic Ocean
- African Coasts

Coastal altimetry products creation and validation

- The SAMOSA+ SAR retracking and the STAR RDSAR retracking show the best performance in terms of noise reduction and gain of data close to the coast, in the German Bight and in the Eastern Baltic Sea. *(Fenoglio et al.)*
- The SAMOSA+ SAR retracking reduces the noise over the standard PDGS SAR retracking. Including the Range Integrated Power (RIP) in the SAMOSA+ retracking (SAMOSA++) reduces the along-track noise near the coast slightly more. *(Dinardo et al.)*
- Standard processing loses data within 10 km to the coast, compared to ALES. However, the noise increases for the Jason-3 ALES LRM 20 Hz data, while it decreases for Sentinel-3 ALES PLRM 20 Hz data close to the coast. *(Dayoub et al.)*
- The X-TRACK editing at 20 Hz improves the ability to retrieve data close to the coast compared to 1 Hz X-TRACK (2-4 km). Adding ALES retracking improves it slightly more. *(Léger et al.)*
- A new altimetry product called SEAL is under development for the Baltic Sea. It is based on unsupervised classification of altimetry waveforms and ALES+ retracking for peaky waveforms. The method includes regional inter-mission cross-calibration. It fills in the northern part of the Baltic Sea. *(Müller et al.)*

Applications to regional coastal circulation and sea level rise

- X-TRACK altimeter data along the Guinea coast shows the seasonal variability. During the maximum eastward velocities in Summer, they reveal a reverse current very close to the coast. *(Bosson et al.)*
- An index of intrusion of the Northern Current and transport into the Gulf of Lion was developed using synthetic altimetric data from SYMPHONIE model and winds. It works well except for rapid intrusions and when there are strong wind events. *(Casella et al.)*
- An estimate of the transport over the wide Patagonian shelf has been developed and represents time scales from day to inter-annual. The annual and shorter time scales are associated with the meteorological forcing and the inter-annual variability associated with SAM. *(Lago et al.)*
- The coastal altimetry data are used to fill the gap between the offshore mooring array and the shelf, in order to estimate the transport over the wide Patagonian shelf. *(Le Hénaff et al.)*

Altimetry/tide gauge/model comparisons

- The comparison of the altimeter to the tide gauges along the African coast gives mixed results depending on location. Possible causes include placement of the tide gauges, geophysical corrections, errors in the model used to compare... *(Dieng et al.)*
- Tide gauges located in regions with small sea level coherence will not reflect the performance of altimetry measurements. NEMO model is used to group the tide gauge locations based on their long sea level trend length-scales. *(Shaw et al.)*

Discussion

- Interleaved versus geodetic orbit for Jason-3:

  → The geodetic orbit would help improve the mean sea surface, which is important to compute accurate SLA close to the coast.

  → The interleaved orbit would improve the tides estimates. Need to study and quantify the duration of the interleaved phase that would significantly reduce the errors on tide estimates.

- Improving the MDT is important for the currents estimates.

- The altimetry missions should be carefully and regionally cross-calibrated, especially for regional sea level rise studies.

- Some suggestions for more connections with coastal oceanographers and the in situ community.