Comparison of Coastal Altimetry and SAR derived Surface Current in the Coastal Region of the Agulhas Current.

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Outline

• Objectives
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Objectives

• Use the SAR derived velocities to provide a reference to assess the PISTACH products dynamical content in the scales from 15km to 100km

• Try to show the gain of using PISTACH products compared to AVISO along track products
Dataset used
Coastal Altimetry

- Along track 5 Hz PISTACH velocity products
  - MLE4, OCE3, RED3 retrackings
  - SLA filtered at 60km (171pts) and along track velocities estimated on +/- 5pts (ie 14km)

- Along track AVISO (reference velocity products)
  - VFEC filtered at 100 km and sampled at 0.33 Hz
Dataset used
SAR surface current

From ENVISAT ASAR Doppler shift to surface current velocities

\[ \Delta f = \frac{2 \cdot V_{\text{radial}}}{\lambda} \]
Dataset used SAR surface current

- Doppler velocities
- Residual velocities

retrieval of Surface Currents from Doppler shift
Dataset used
SAR surface current

Comparison with a lagrangian drifter
(15m depth)

Demonstration products available online:
http://soprano.cls.fr/L2/currentProducts/
Map of surface velocity of the Agulhas Current using SAR Doppler information.

Agulhas current seen on AVISO merged velocities: 3 days mean.
Selection criteria

- Less than 36 hours between SAR and Jason 2
- No situations with low SAR winds (noisy doppler signal)
- SAR velocities reprocessed with best sea state corrections based on ECMWF wind analysis.

→ 92 collocations for tracks 96 and 20
Methodology

• Comparaison of velocity anomalies
  – Projection of SAR radial velocities on Jason 2 tracks at the sampling of Jason2 products.
  – Removal of mean current (MDT CNES-CLS09_v1.1) from SAR projected velocities
Methodology

SAR vs. MDT CNES-CLS09_v1.1
Methodology

Surface current direction from SST
Methodology

Vector projections according to local current direction from SST
Methodology

Vector projections according to local current direction from SST
First results track 96

Better coverage of the last 30 km near the coast
First results

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More small scale structures on the PISTACH velocities compared to Aviso products, result confirmed by the SAR currents.
Discussion

• SAR Doppler derived velocities from ENVISAT ASAR wide swath have scales up to 17km (8.4km sampling along track).

• First promising results showing higher dynamical content of PISTACH compared to AVISO at mesoscale.

• Need to refine SAR velocities to account for angle shift between SAR and Jason track angle.