Coastal Ocean Evaluations of Jason-1 & Jason-2: Preliminary Comparisons

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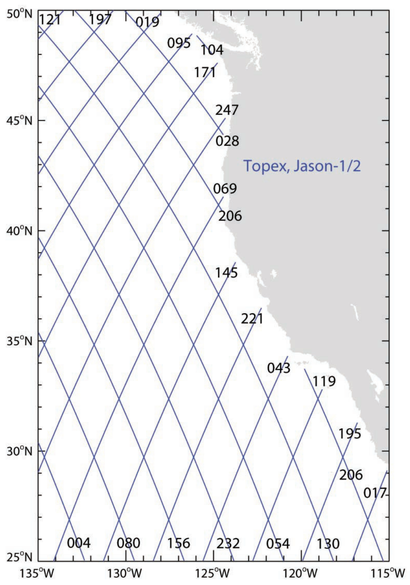
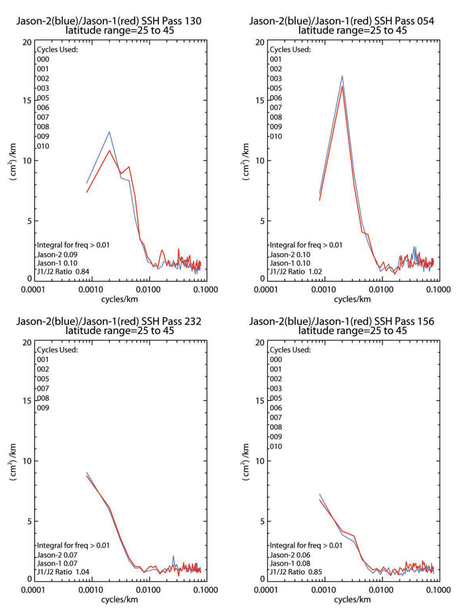
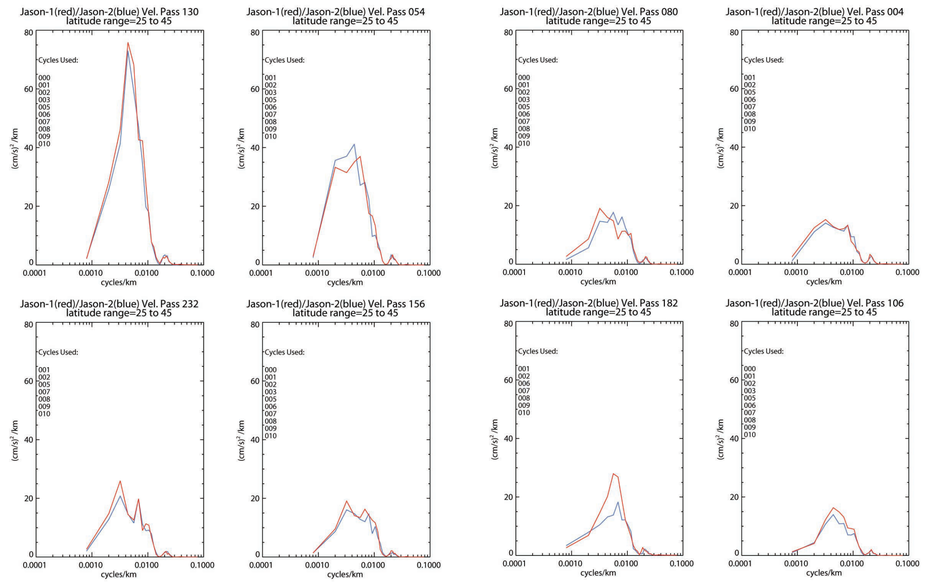
"Validation" Activities: Although the most thorough evaluation of the consistency between Jason-1 and Jason-2 data will come from extensive scientific analyses over the next several years, initial comparisons are useful for finding any obvious differences between the two altimeter systems, while sampling nearly identical geophysical signals.

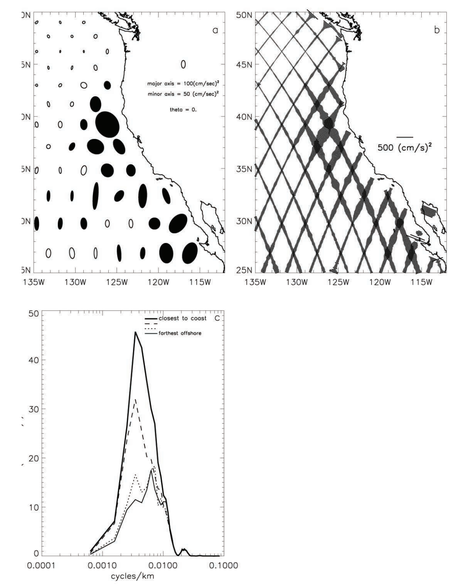




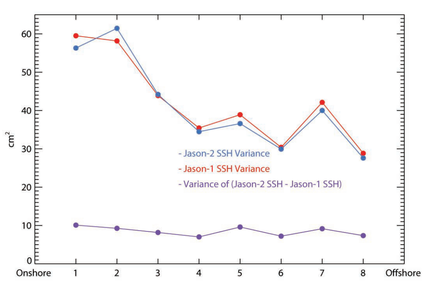
Jason-1 vs Jason-2 - SSH Spectra
(Jason-2 is blue, Jason-1 is red)
For the first four tracks moving offshore (130, 054, 232, 156), SSH spectra are in good agreement.



Jason-1 vs Jason-2 Results - Cross-Track Velocity Spectra
(Jason-2 is blue, Jason-1 is red)
Compared to TOPEX results from four years of data, 6-10 cycles of Jason-1 and Jason-2 data provide similar wavenumber spectra for cross-track velocities. The main point here is to compare Jason-1 and Jason-2, which generally agree as to the dominant wavelength and energy levels. Dominant scales decrease slightly as one moves offshore, although not as much as for the longer TOPEX record.



TOPEX Results - Cross-Track Velocities
Four years of TOPEX alongtrack data were used to calculate cross-track geostrophic velocities. From these, variance ellipses, cross-track velocity variances and alongtrack velocity wavenumber spectra were calculated. These show a decrease in wavelengths and energy moving offshore.



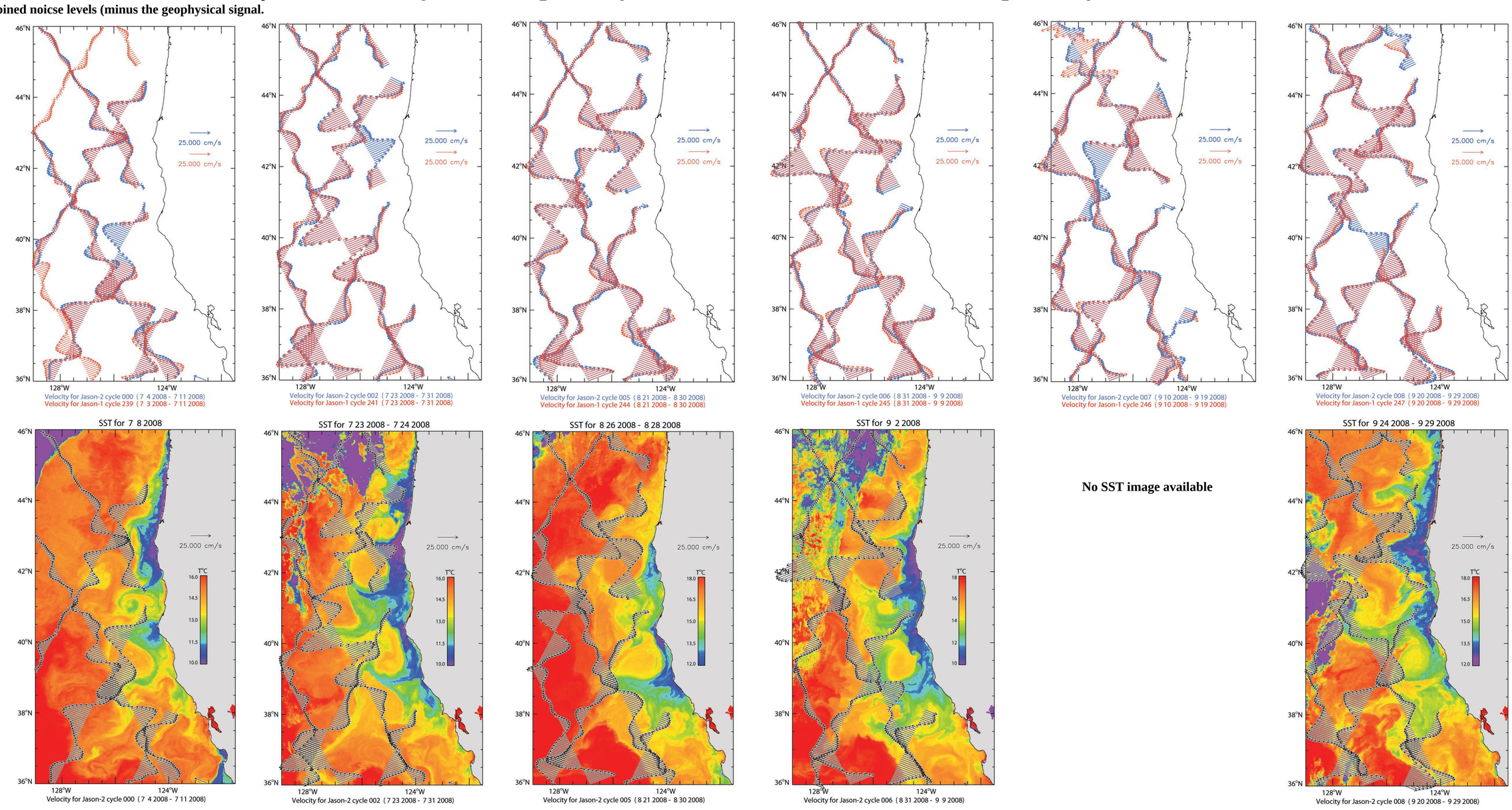
Variances of Alongtrack V SSH and V
Variances of SSH and V (cross-track geostrophic velocity) along the eight tracks parallel to the coast which do not hit the coast (130, 054, etc.), moving from nearshore to offshore (left to right). Velocities with and without smoothing with a 50 km half-power loess filter. Differences between the two altimeters represent the combined noicse levels (minus the geophysical signal.

Agreement is Generally Good Between the Two Altimeters

Spectra of SSH and cross-track geostrophic velocity are in good agreement between Jason-1 and Jason-2 in this regional comparison, using alongtrack data from the IGDR's. The spectra (above) and the variances (left) also agree with the values found previously for TOPEX data (cross-track velocities, above right) and for the initial comparisons between TOPEX and Jason-1 data (alongtrack SSH and cross-track velocities variances, left).

Below, comparisons of the cross-track velocities for individual cycles shows general agreement except for a few "patches" of disagreement. An example of this disagreement is seen in the northern regions for Pass 206 during cycle 7 and pass 028 during cycle 8. Comparing cycles 7 and 8 and noting that features are fairly persistent (long time scales), Jason-2 (blue) seems to be more temporally consistent. Looking more closely at the components of the SSH signals (not shown), it appears that there are anomalies of both the range estimates and the SSB corrections over 50-150 km long sections of track, affecting both Jason-1 and Jason-2 (probably) but appearing to be stronger in Jason-1. These anomalies are still being investigated.

Comparing Jason-2 to the SST images, the patterns are as expected for the energetic meanders of the alongshore jet, seen repeatedly in T/P and Jason-1 data over the past 16 years.



No SST image available

This work is supported by the NASA Ocean Surface Topography Science Team, with additional support by NOAA and the Cooperative Institute for Oceanographic Satellite Studies (CIOSS).