Calibration of Global Variations in Ocean Altimetry

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Long term global and regional studies rely on the calibration of the fundamental measurements more than other uses of altimeter data. The six month collinear overlap of the TOPEX/POSEIDON and Jason missions provided a unique opportunity for cross calibration of the two missions. This phase allowed Jason to be calibrated to the accuracy needed to support tenth millimeter per year measurement of global sea level change, and it also allowed the discovery of features in TOPEX data that had not been previously documented. This experience shows the importance of overlap and direct comparison of instruments involved in long term measurements.

In addition to the overall global calibration, it is critical that regional, temporal, environmental (mainly, wave height) and system state (mainly temperature related to the orbit) variation of measurements be calibrated. Results are presented for both TOPEX and Jason on the variation of geophysical measurements with these parameters separated by north/south (N/S), ascending/descending (A/D) in order to discern effects from range rate, acceleration, and changing environmental conditions. Some of the features indicate the need for revisions to Jason calibration, while most differences with a N/S A/D dependence arise from incomplete calibration of TOPEX Alt-B. Variations of both TOPEX and Jason microwave radiometers (TMR, JMR) with satellite yaw state are also shown.

TOPEX has been moved to the tandem mission orbit offset by one-half track spacing. While it may be difficult to directly compare sea surface heights from the displaced orbits, a number of quantities, such as Wet Tropo, SWH, and Sigma0, that should still compare well are investigated. This will allow for continuous monitoring of Jason performance.

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