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Poster
The sea-surface expression of internal tides is spatially-variable, reaching a maximum of about 10cm near generation sites associated with submarine topography. Model results indicate that the internal tide wave field in the open ocean is a complex superposition of waves generated at multiple sites. Long time series obtained from exact-repeat missions (Topex, Jason-1, Jason-2, GFO, ERS) resolve the low-mode internal tide field at the scale of the inter-track separation. Here we attempt to make improved, higher-resolution, maps by combining exact-repeat and non-repeat altimetry. The approach involves combining sea-surface height from exact-repeat missions and sea-surface slope from non-repeat missions (geodetic missions and long-repeat orbit missions) in order to reduce the impact of different error characteristcs in the two data sources. The tides are modeled as a tensor product of spatial thin-plate splines and harmonic time dependence. Current results utilize exact-repeat data from the Topex/Poseidon and Jason-1 missions, and non-repeat data from the Geosat geodetic mission, the Jason-1 geodetic mission, and Cryosat. The answer to the question, "Can Geodetic-Mission Altimetry be used for High-Resolution Mapping of the Internal Tides?", is shown to depend on which and how much geodetic mission data is used, and the properties of the tidal fields to be estimated.
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