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Poster
Global and regional mean sea level trends derived from TOPEX/Poseidon, Jason-1, and Jason-2 (OSTM) altimetry (TPJAOS) are reassessed based on estimates employing recent advances in the time variable gravity and ITRF2008-based terrestrial reference frame realizations in the Precise Orbit Determination (POD). Global mean sea level (GMSL) estimates derived from the 20-year altimeter record are shown to have recent significant departures from the relatively stable long-term linear trend of 3.2 mm/yr. A brief period in which GMSL dropped nearly 1 cm from the linear trend is observed (Boening et al., 2012) followed by a pronounced rapid recovery exceeding 2 cm over the last two years. Regional sea level trend comparisons for the first and last 3-years of Jason-2 observations reveal basin scale reversals, with global means rising from 1.3 mm/yr to 7.1 mm/yr. Many of the obstacles previously impeding the measurement and validation of estimates of GMSL from satellite altimetry have been overcome (Fu and Haines, 2012). Nevertheless, due to the dynamic nature of the Earth rendering an unstable terrestrial reference frame (TRF), and error in modeling regional variations in the geopotential, the challenges of measuring geocentric sea level will persist. Case in point is the prior underestimation of recent regional trends by as much as 3 mm/yr in the North Atlantic, which are shown to be primarily a direct consequence of earlier POD omission error in modeling the complex time variable gravity. In this paper we assess the impact of revised POD standards on global and regional MSL estimates derived from the TPJAOS sea surface height record, in particular recent trends from the Jason-2 period, and the subsequent impact on validation results generated from tide gauge comparison analysis.
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