The importance of coastal altimetry retracking and detiding: A case study around the Great Barrier Reef, Australia

A new approach for improving the accuracy of altimetry-derived sea level anomalies (SLAs) near the coast is presented. Estimation of SLAs is optimized using optimal waveform retracking through a fuzzy multiple retracking system and the most appropriate detiding method. With the retracking system, fuzzy-retracked SLAs become available within 5 km of the coast; meanwhile it becomes more important to use pointwise tide modelling rather than state-of-the-art global tidal models, as the latter leave residual ocean tide signals in retracked SLAs. These improvements are demonstrated for Jason-2 waveforms in the area of the Great Barrier Reef, Australia. Comparing the retrieved SLAs with in situ tide gauge data from Townsville and Bundaberg stations showed that the SLAs from this study generally outperform those from conventional methods, demonstrating that adequate waveform retracking and detiding are equally important in bringing altimetry SLAs closer to the coast. © 2014 Taylor & Francis.

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