



An Adaptive Land Flag for SAR Altimetry Waveform Processing in Coastal Areas

Kuo-Hsin Tseng (1), Chung-Yen Kuo (2), and Che-Kwan Shum (3)

(1) National Central University, Center for Space and Remote Sensing Research, Taoyuan, Taiwan (khtseng@csrnr.ncu.edu.tw), (2) National Cheng Kung University, Dept. of Geomatics, (3) The Ohio State University, School of Earth Sciences

SAR altimeters (e.g., Sentinel-3) aim to improve coastal sea level observation by splitting Fresnel zone in azimuth direction via delay doppler processing. The ~ 350 m width of band-shape coverage can effectively avoid land contamination in the waveform near the coastal area. However, some hyperbolic curves of anomalous peaks exist in a sequence of waveforms when the footprint is still >10 km away from the shoreline, owing to the inaccurate land flag and varying tidal height. The sediment exposure of intertidal flat could extend few kilometers seaward during low tide and induce unexpected waveform retracking errors. Hence, this study first builds a coastal digital elevation model and simulate the accurate shoreline at the moment of altimetry passage. We introduce an adaptive land flag in the waveform gates been potentially contaminated and retrack again by empirical retracers, such as Threshold and OCOG. Our preliminary results show that the accuracy of coastal sea level observation can be improved from meters level to 20-30 cm while using the modified waveform in the 1-5 km zone nearshore.