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Hydrology Study in Rivers and Rice Fields using Waveform Retracking of Satellite Altimeter

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Satellite altimetry is originally designed to monitor global sea surface topography; however, its capabilities of measuring non-ocean surfaces have been demonstrated with adequate accuracy. Because the roughness and elevation variability of oceans are not identical with that of the non-ocean surfaces, such as land, inland lake, river and wetland, the altimetric radar waveforms have to be retracked to optimally compute accurate altimetry range measurements. In this study, 10-Hz TOPEX/POSEIDON (T/P) altimeter is used to monitor height changes over rice fields and water level changes in small rivers in southwest Taiwan by applying different radar waveform retracking algorithms, including the Offset Center of Gravity (OCOG), the threshold, and the modified threshold retrackers. Finally, the results are validated by comparison with in the situ data such as the records of rainfall, groundwater and water gauge records and are intended to be used for geophysical interpretation.