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Recovering information from altimeter observations in the coastal zone: a comparison of waveform retrackers

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Recovering meaningful estimates of geophysical parameters (sea level, significant wave height and wind speed) from altimeter data in the coastal zone requires, amongst other things, accounting for the modification of the altimetric echoes (waveforms) when land or bright reflecting targets (such as a patch of very calm waters) enter the footprint of the instrument. In this work we compare different techniques and strategies for the retracking of the waveforms in the coastal zone, where by 'retracking' we mean the fitting of a waveform model to the observed echoes, the process that allows the estimation of the parameters.

While over open ocean the waveform shape is well described by the model due to Brown (1977), in the coastal zone slightly more sophisticated approaches are necessary. We have performed retracking of Envisat RA-2 and Jason-2 echoes over a number of coastal locations with different forms of the fitting functions, like for instance a combination of a Brown model and Gaussian peaks suggested by Halimi et al (2012); we discuss the pros and cons of each retracker and provide an assessment of their ability to recover more (and more accurate) data that the standard Brown retracker in the coastal zone.