



Validation of recent tide models by means of crossover differences and time series of bottom pressure and tide gauges

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Since a few years quite a number of new tide models like FES2004, GOT4.7, TPXO7.2, EOT08a, DTU10, EOT11a, and HAMTIDE have been issued, all of them claiming to describe on global scale the tidal elevation and the short-term water mass variations in the system Earth. The objective of the present paper is to perform a comparative validation by means of altimetric crossover differences and time series of bottom pressure and tide gauges. The method followed here is to apply the corrections of the models under investigation and to look for the most significant variance reduction of single and dual satellite crossover differences, performed by multi-mission satellite altimetry and by the reduced scatter in the time series of bottom pressure and tide gauges. The validation of ocean tides in shallow water is much more difficult than in open ocean. Over extended shelves, the tidal signal amplitude increases significantly, such that proving a variance reduction becomes more and more difficult due to the unfavorable signal-to-noise-ratio. Moreover, there are non-linear effects in shallow water. Therefore, the validation is investigated separately for shallow water and open ocean conditions.