Detlef
Stammer
CEN, Universität Hamburg
Oral
Our knowledge of the dynamics of ocean tides as well as their impact on the general circulation has improved considerably since the launch of Topex/Poseidon twenty years ago. Very precise satellite altimeter data have been essential for improving empirical and hydrodynamic tide models. The geophysical applications of these new models have been widespread, including the provision of tidal corrections to altimetry, thereby enabling the study of non-tidal oceanic motions. This paper provides an accuracy assessment of state-of-the-art global tide models, including purely empirical, purely hydrodynamic, and dynamical models constrained by observations. The goal of the paper is to quality-assess modern global tide models and to understand some of their limitations by comparing them against a number of independent test data sets representing both the deep ocean and shallow seas. Tests are provided in terms of comparisons against bottom-pressure data, selected coastal gauges (primarily in polar regions), independent satellite altimeter data, and satellite gravimeter data. Long-wavelength components of models bearing implications for precise orbit determination are tested by analyzing laser ranging measurements to special geodetic satellites. Also for the first time we provide an assessment of tidal currents available from (selected) models by comparing against tidal velocities estimated from current meters located in the deep ocean and from acoustic tomography. A high-resolution 3-D model is used to assess limitations from inadequate vertical sampling at moorings. In several cases the tidal models have revealed flaws in the test data, including in some historical measurements long in use.

This talk will provide an overview about the joint work; detailed results will be presented in form of posters by several co-authors.
OSTS session
Quantifying Errors and Uncertainties in Altimetry Data
Meeting name
Ocean Surface Topography Science Team (OSTST) Meeting
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