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## Impact of reference frame instabilities on satellite altimetry

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Multi-mission cross-calibration of contemporary altimeter missions exhibit significant differences in the center-of-origin realizations. This motivates general consideration on the stability of the reference frame applied to generate the orbits of altimeter satellites which in turn are taken as reference for mapping and monitoring mean sea level. The orbits of TOPEX/Poseidon, e.g., are based on laser and DORIS station solutions and were initially related to ITRF96, later ITRF97. The update from ITRF97 to ITRF2000 would imply a significant change in scale. The tracking station network evolves with time and systematic effects may exist due to technique-specific biases or due to the fact that ITRF station coordinates refer to a hypothetical tide-free not the real Earth crust. These instabilities and systematics are considered and their impact to the long-term determination of mean sea level is investigated.