Title: Generation of Altimeter Climate Data Records Using Retracking and Updated Corrections

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Problem Statement: Nearly 20 years of high precision altimetry data have been acquired from TOPEX and the Jason series, but they have not been processed in a uniform way with advanced waveform retracking methods (determine measurement parameters by fits to the waveforms). There are project plans to reprocess the Jason data, but not TOPEX. This proposal will apply retracking and updating of TOPEX data to the Jason standards. After reprocessing and application of the latest orbits and corrections including improved radiometer calibration and processing, the Sea State Bias (SSB, variation of range measurement with surface wave height and wind speed) – one of the largest remaining error sources – must be determined and added as a correction. With this processing, the TOPEX data should reach the 3.5 cm accuracy level in Sea Surface Height (SSH) and be suitable for determining sea level change over the entire record at the millimeter per year, or better, level with well-understood errors. Retracking is particularly important for the TOPEX data because TOPEX Alt-A, in use from the beginning of the mission until February 1999, exhibited instrumental changes from about cycle 140 (1996) until cycle 235 when a switch was made to Alt-B that can only be corrected by retracking with an adjusted point target response (PTR) for the radar.

Proposal Summary: JPL proposes to retrack the entire TOPEX data set from building on the method described by Rodriguez and Martin (1994) and used in producing TOPEX Retracked GDRs (Geophysical Data Records). JPL will incorporate improvements to improve stability and separation of parameters. JPL will then update these records with improved orbits, tides, and radiometer data. JPL's work will build on NASA work under the Ocean Surface Topography Science Team (OSTST), the MEASURES program to develop an improved altimeter data set under PI Richard Ray of Goddard Space Flight Center (GSFC). Two Co-Is from that team will contribute to this work in the area of orbits, tides, radiometer corrections, and validation of the data. JPL's work will use products and tools from the NASA ACCESS07 proposal ―Web-based Altimeter Service and Tools by PI P. Callahan (Callahan et al., 2007) to update the records in netCDF format. JPL will also process the TOPEX/Jason-1 and Jason-1/Jason-2 overlap periods to verify project processing and cross-calibration results. JPL will consult with NOAA subject matter experts on models and corrections and data validation. JPL will coordinate with CNES and NOAA to produce a consistent data format in netCDF to provide improved access to the data.