

DETERMINING OCEAN CIRCULATION FROM ALTIMETRIC SEA LEVEL MEASUREMENTS

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The sea-surface elevation relative to the geoid is a dynamic boundary condition for the three-dimensional oceanic pressure field. This boundary condition has been determined over the global ocean every 10 days by a precision radar altimeter aboard the TOPEX/POSEIDON satellite since October, 1992. This is the most accurate altimeter data stream to date for the study of the ocean general circulation and its variability. The determination of the absolute surface geostrophic currents is limited to scales larger than spherical harmonics of degree and order 14 due to the uncertainty in the current geoid models at smaller scales. However, the precise sea level measured along repeat satellite ground tracks allows accurate determination of the temporal variabilities of the ocean from basin scales to mesoscales (10-10,000 km). Scientific highlights of this longest-running altimetric satellite mission include improvements in our understanding of the dynamics and thermodynamics of large-scale ocean variability, such as, the properties of planetary waves; the energetics of basin-wide gyres; the heat budget of the ocean; and the ocean's response to wind forcing. These data provide a unique test-bed for global ocean models and have set the stage for operational ocean applications. Looking to the future, all spacecraft systems remain healthy and we are optimistic TOPEX/POSEIDON will produce many more years of global sea level data. Moreover, a series of future altimetric satellites will ensure the continuation of the data stream into the next century for providing a key measurement to understand and monitor global change.

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2. G9/SE13 "Modelling of global change phenomena with observational geodetic and geophysical constraints"
3. Hans-Peter Plag, Benjamin Fong Chao
4. standard
5. Oral
6. No