



## **Variability of Global Ocean Mass Transport and Its Geodetic Importance**

Richard Gross

Jet Propulsion Laboratory, Mail Stop 238-600, Pasadena, United States (richard.gross@jpl.nasa.gov, +1 818 393 4965)

The oceans have a major impact on global geodetic properties of the Earth. Nontidal changes in oceanic currents and ocean-bottom pressure have been shown to be a major source of polar motion excitation and also measurably change the length of the day. The changing mass distribution of the oceans causes the Earth's gravitational field to change and causes the center-of-mass of the oceans to change which in turn causes the center-of-mass of the solid Earth to change. The changing mass distribution of the oceans also changes the load on the oceanic crust, thereby affecting both the vertical and horizontal position of observing stations located near the oceans. The geodetic importance of changes in the mass transport of the oceans are studied here using a number of different ocean models including those not constrained by any data, those constrained by data, and those operated in forecast mode.