



## **Analysis of satellite altimetry observations during the Sumatra Tsunami of December 26, 2004**

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A  $M=9.0$  megathrust earthquake that occurred at 00:59 UTC on December 26, 2004 along 1000 km of the subduction zone west of Sumatra and Thailand in the Indian Ocean generated a global-scale tsunami. This tsunami was recorded by several satellites, including JASON 1, ENVISAT and TOPEX-POSEIDON. The sea surface altimetry data collected by the satellites were used to examine the spectral characteristics of the open ocean tsunami waves as they propagated westward toward India and Sri Lanka. Results from the altimetry profiles have been compared with the Indian Ocean tide gauge records. Wavelet analysis of the wave elevation reveals that the high frequency components of the 2004 Sumatra tsunami were markedly dispersive. The observed dispersion was found to be in a good agreement with theoretical estimates of the dispersion derived from the group velocity of the waves. The results of this analysis demonstrate the importance of wave dispersion for tsunami wave propagation and transformation and indicate the necessity to take into consideration this factor in numerical simulations of tsunami waves.