

Dispersive tsunami generated by the 2013 off the Santa Cruz Islands earthquake (M8.0)

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On February 6, 2013, great earthquake (M8.0) occurred off the Santa Cruz Islands in Solomon Islands. We have simulated the tsunami generated by this earthquake using linear long wave theory and dispersive theory. The assumed tsunami source is located off the Santa Cruz Island (10.7°S, 165.1°E, depth 28.7 km). We assumed the following source parameters: strike 309°, dip 17°, rake 61°, length 119km, width 59km, and slip 5.9 m based on the moment tensor solution by USGS and scaling laws.

Based on the two types of the numerical simulations and the comparison with the simulation results and the observed tsunami data, we obtained the results as follows: (1) the difference between the simulation of long wave theory and dispersive theory is appeared clearly in the direction of the minor axis of the tsunami source, (2) dispersive tsunami observed at DART station 55012 located in the southwest direction of the source, and (3) dispersive tsunami observed on the second tsunami phase at DART station 55023 located in the west-southwest direction of the source. Our results shows dispersion effects cannot be neglected on the modeling of the 2013 off the Santa Cruz Islands tsunami.

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