

Fault model associated with M8.1 earthquake in Solomon Islands on April 1, 2007, inferred from ALOS/PALSAR data

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The Solomon Islands is a nation composed of many islands located in the southwest Pacific Ocean. Two major plates, the Pacific and Australian plates, and two minor plates, the Solomon Sea and Woodlark plates, produce complicated tectonics in the southwest off the Solomon Islands. On April 1, 2007 (UTC), a M8.1 interplate earthquake occurred in the subduction zone between the Pacific Plate and the Australian Plate (S8.48, E156.98) [see the USGS web site for time of occurrence, type, magnitude, and location of the earthquake]. This earthquake was accompanied by a large tsunami and caused considerable damage in the area.

The Japan Aerospace Exploration Agency (JAXA) performed emergency observation using the Advanced Land Observing Satellite (ALOS) and tried to acquire information on the afflicted area as soon as possible. The Phased Array type L-band Synthetic Aperture Radar (PALSAR) installed on ALOS is especially well-suited for the purpose that is disaster monitoring or observation in a remote location like the Solomon Islands.

Using PALSAR images observed before and after the earthquake, ground deformations were detected over a wide area by a DInSAR technique. We presume that such deformations represent co-seismic deformations caused by faulting, and tried to model these observed deformations using a fault model [Ozawa & Miyagi, 2007]. Results from this modeling could account for observed data well and a pattern of slip distribution was in good agreement with results from modeling using a teleseismic body wave, although larger slip were estimated in our model. In this presentation, taking into consideration the results from field investigation [e.g. Nishimura et al., 2007; Miyagi et al., 2007; Griggs et al., 2007], we try to constrain model parameters and calculate again after the way of Ozawa & Miyagi [2007].