

What caused the unusual Non-DC component observed in the Jan. 28th 2012 Tanzawa earthquake?

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The Tanzawa mountain area is seismically very active: the seismicity in the western Tanzawa is mainly caused by collision of the Izu peninsula and that of the eastern part is caused by subduction of the Phillipine sea plate. Especially in the western part, magnitude (M) ~ 5 earthquake which accompanies similar sized foreshock has been periodically observed. The cause of foreshock is still controversial. The last seismic activity in this region was on January 2012; the M5.4 mainshock occurred on January 28th followed by its M4.7 foreshock occurred 4 minutes later and the aftershock sequence lasted 13 days. One interesting observation of the sequence was that the both foreshock and mainshock exhibited unusual amount of CLVD component whereas similar sized after shock showed nearly pure double couple. The results of the moment tensor inversion using precisely determined hypocenter location and moment rate function analysis indicated that the complex faulting system in the hypocentral area caused the large CLVD. It is consistent with the mechanism differences between ~ M5 earthquakes observed during the sequence. It implies there is a relationship between the complex faulting system and the triggering mechanism of the foreshock.

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