

Detection of crustal movement at the 1998 earthquake swarm off the east coast of Izu Peninsula by JERS-1 InSAR

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Since 1970s earthquake swarms have been intermittently activated once or twice during one to two weeks a year off the east coast of the Izu Peninsula, central Japan, where is characteristic of many monogenetic volcanoes. So there are various observation networks of GPSs, seismometers, gravity stations, leveling lines and so on.

We detected crustal movements associated with earthquake swarms in March 1997 and April-May 1998 by JERS-1 DinSAR and constructed an optimum fault model by comparing with other models based on terrestrial measurements (e.g. GPS, leveling, EDM, precise hypocenter determination). Patterns of crustal movement in both two cases were explained by one major tensile fault and one lateral fault motions induced by tectonic stress. It was revealed that slant range changes were precisely measured by DinSAR with the accuracy of sub-centimeter when good correlated data (e.g. data acquired in winter season) were selected even though Izu area are very steep mountainous and vegetated. However, strong atmospheric noises, which appeared as phase undulation with 10 - 15 km in wavelength, were observed by using data acquired just after passing of developing front. Such wavelike patterns of phase noises may be caused by mountain and valley breeze flowing over the Izu Peninsula.