Seismic activity and ground deformation in and around Akita-Komagatake and Iwate volcanoes, possibly triggered by Off-Miyagi EQ

Sadato Ueki[1]; Satoru Tanaka[2]; Minemori Sato[3]

[1] RCPEVE, Tohoku Univ.; [2] Graduate School of Sci. Tohoku Univ; [3] Research Center for Prediction of Earthquakes and Volcanic Eruptions,Tohoku Univ

Micro-earthquake swarms took place at Akira-Komagatake volcano in May and June of 2003. The background seismicity in the region is rather low and the onset of the first activity was 33 hours after the Off-Miyagi Earthquake (M7.0). So we interpret the series of seismic activities at the volcano was remotely triggered by the Off-Miyagi Earthquake, about 130 km SSE from the volcano. The hypocenters of the swarms were distributed at the depths of 3-4 km beneath the summit in May and 1-4 km beneath the northern flank in June. The swarm in June is characterized by the activity of low-frequency earthquakes with predominant periods of 2-3 Hz.

At the nearly same time as the June swarm, small but evident ground deformations were observed by borehole tilt-meters and strain-meters installed around Akita-Komagatake volcano and neighbor Iwate volcano. The largest deformations reaching 500 nanoradian in tilt and 110 nanostrain in volumetric strain were observed at station GNB located at the southwestern foot of Iwate volcano and 13 km northeast from the summit of Akita-Komagatake. On the other hand, the displacements observed at seven GPS stations were as small as 5 mm or less. We tried to find the model and the location of the source for the deformations. However, we failed to determine the model satisfying the observations. There remain two candidates; a tensile crack near the hypocenter region beneath the northern flank of Akita-Komagatake and a point source at the southwestern foot of Iwate volcano where the largest deformations were observed. Judging from the small displacement at the western foot of Akita-Komagatake, the latter is preferable to the former. It means that the seismic activity at Akita-Komagatake volcano and the ground deformation at Iwate volcano might be simultaneously triggered by the Off-Miyagi Earthquake.