

Deep low frequency earthquake activity at Mt. Fuji

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Deep low frequency (DLF) earthquake activity at Mt. Fuji increased from October to December in 2000. This activity had been known since early 1980s. The DLF earthquakes usually occur successively within several minutes. We count the successive activity as one event. The annual average of occurrence of DLF event is 14. In October, November and December of 2000, monthly numbers of the event are 34, 71 and 43, respectively, indicating noticeably high activity. We report temporal variation of the activity, hypocenters, characteristics of the seismograms and other relevant phenomena of the DLF earthquakes at Mt. Fuji.

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The DLF earthquakes usually occur successively within several minutes. We count a group of the successive earthquakes as one event. From 1980 to 2000, 473 events occurred, 180 of which occurred within 20 years from 1980 to 1999. The annual average of occurrence of DLF event is 14. In October, November and December of 2000, monthly numbers of the event are 34, 71 and 43, respectively, indicating noticeably high activity.

The hypocenters of the DLF earthquakes distribute mainly at 2 to 3 km from the summit in NE direction, and at 15 km deep. Due to the difficulty of identifying first arrivals of the DLF earthquakes, the hypocenters scatter over several kilometers. The predominant frequency of the DLF earthquakes ranges from 1 to several Hz, and oscillations with frequencies lower than 1Hz are sometimes observed. Four tiltmeters at the foothill of Mt. Fuji, which have been installed by the National Research Institute for Earth Science and Disaster Prevention, do not show any abnormal tilt change during the high activity period of the DLF earthquakes.

The change of the DLF earthquake activity has shown relationship to other seismic activity; (1) the DLF activity was high in 1987, when earthquakes felt only at the summit of Mt. Fuji took place, (2) the increase of the DLF earthquake activity in 2000 started in the late August in coincident with the cease of the seismic swarm at Kozu-sima region, and the abrupt increase from October to December is coincident with the time of recovery of the seismic quiescence area in Tokai-region, (3) the seismicity of tectonic earthquakes at the southern part of the Mt. Fuji became high in January and February, 2001.

The DLF earthquake occurs presumably in relation to deep magmatic activity. The relationship between the DLF earthquakes and seismicity at the surrounded areas suggests that crustal stress changes affect deep magmatic activity.