A Mj3.2 Earthquake Followed by a Deep Low-Frequency Earthquake Activity near the Yake-dake Volcano, Central Honshu, Japan.

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A shallow earthquake of Mj3.2 followed by a swarm activity of deep low-frequency (DLF) earthquakes was observed near the Yake-dake volcano, Hida mountain range, central Japan. The mainshock of the shallow activity took place on December 30, 2003 at about 5 km NNE of the summit of the Yake-dake volcano at the depths of around 5 km. Aftershock activity was then observed for about one week and most of the aftershocks are located in the nearby region. Focal mechanism of the mainshock and the second largest event exhibit the strike-slip fault type with the NW-SE compressional stress field, which is consistent with those of the past seismic activity.

DLF activity started on January 6 and was activated on January 22. More than 30 events were observed by the end of January. Most of them are isolated type events, however several tremor like events have been also observed since end of January.

In the Hida mountain range, an intense swarm activity whose largest earthquake was Mj5.4 took place on August 1998, which was also followed by a swarm activity of DLF earthquakes. After the 1998 swarm, although there have been several small scale shallow swarm activity, no swarm activities of DLF earthquakes had been observed.

We also examined the continuous seismogram records since 1996 and recognized that no DLF swarms but above two cases were observed. The common feature of the shallow activities in 1998 and 2003 is that largest event of the swarms are larger than magnitude 3, which might have triggered the deep seismicity.

In this region, there were other shallow swarms whose largest events are as large as magnitude 3 in early 1990's. It is important to investigate these past shallow swarms whether deep seismic activities were accompanied in order to clarify the magma activity beneath the Yake-dake volcano.