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Analysis of Ground-vibration induced by the sediment disaster on Izu Oshima, Tokyo in October 2013

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October 2013, at the Mariana Islands, typhoon Wipha occurred. Wipha attacked Izu Ohshima of Japan and brought heavy rain. Izu Ohshima is part of Tokyo Metropolitan prefecture.
Ohshima rain-gauge station of Japan Meteorological Agency showed 118.5 mm per hour and 824.0mm per 24hours. This 24 hour rainfall was about 2.5 times higher than the average rainfall for October (329.0mm / 24hour). And then, a lot of shallow landslides and debris flow has occurred. Thirty six people were killed and four people were missing by these sediment disaster. It is important to clarify that "When and where did disaster occur?". A lot of seismographs for volcano observation are installed in Izu Ohshima. And then, it is known that when sediment moved, ground-vibration occurred. We estimated time and location of disaster by analyzing ground-vibration in sediment moving. First, we estimated that the disaster occurred from 2:00 a.m. to 3:00 a.m. of October 16 by some newspaper reports.
Second, we collected data of installed seismographs in Izu Ohshima and analyzed. And then, we caught that some wave data existed. These were different from earthquake data. We estimated that these showed ground-vibration data in sediment moving. Finally, we estimated hypocenter (location of sediment moving) by relationship between "distance between hypocenter and seismograph" and amplitude. Methods are as follows.
Making envelope on basis of collected seismograph data and calculating maximum
amplitude (y) Calculating amplitude (x) on basis of some assumed hypocenters
Setting hypocenter (location of sediment moving) by minimum residual of y and
x Comparing of set hypocenter and actual location of sediment moving.
We found that distance of set hypocenter and actual location of sediment moving is close.
Therefore, when sediment disaster occurs, by analyzing seismographs data, it may be possible to estimate that the location and timing of sediment moving. And, it may be possible to use as tools for people to evacuate.