

Matched Filter Method implemented as an automatic hypocenter location system

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Seismic activity near Mt. Hotaka in the Hida Mountains, central Japan was analyzed by using the Matched Filter Method (MFM). In this analysis, MFM was implemented as an automatic hypocenter relocation system. We selected about thirty (30) template earthquakes in the target region that enables us to detect more than 3,000 events and locate about 800 earthquakes in the time period from April 2013 to October 2013. Comparison with manually inspected results indicates that location errors by MFM system is within a couple of kilometers. The seismic activity in the target region started in April 2013 and most intense activity occurred in October 2013. The largest event took place on October 8, 2013 at 19:28 (JST) whose magnitude was 3.9 (JMA). Epicentral area extends about 4 km in EW direction with 1 km in NS direction at the eastern flank of Mt. Hotaka. Although manually inspected catalogue data is essential to evaluate seismic activity, we suppose MFM is one of the powerful tools to automatically obtain preliminary results for the swarm activity that concentrated in a small area such like this study or volcanic regions.

Keywords: Swarm activity, Hida Mountain range, Matched Filter Method