

Spatio-temporal evolution of seismicity following the 2016 Kumamoto earthquake: Migrations of early aftershocks following M6.5 earthquake

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A series of powerful earthquakes and the following aftershocks has struck the Kumamoto area in Kyusyu, Japan, from 14th April, 2016. These powerful earthquakes have caused destructive damages in the central part of Kyusyu. We relocated a bunch of earthquakes associated with the 2016 Kumamoto earthquake (~2700 events), applying a double-differential code to arrival time data set constructed by JMA, and waveform cross-correlation technique. Then, we newly detected numerous earthquakes using these relocated earthquakes as template events, applying a matched filter technique to continuous waveform data recorded at 35 seismic stations in the central Kyusyu area. Most of relocated hypocenters are aligned along nearly vertical planes or north-westward dipping plane. Hypocenters before M7.3 earthquakes were concentrated near surface traces of active faults in northernmost segment of "Hinagu" and a part of "Futagawa". After M7.3 earthquake, they shifted toward northwest ward and aligned gently northwest ward dipping plane. Early aftershocks following M6.5 earthquake clearly expanded along fault strikes during a half day. But, aftershock zone slightly continued to expand perpendicular to fault strikes until the generation of M7.3 earthquake. The M7.3 earthquake has immediately boosted a widespread seismicity along the northeastern extension of the Futagawa fault, as well as the northwestern section of the Hinagu fault.

Keywords: Kumamoto earthquake, Seismicity, Migrations of aftershocks