

## Foreshocks and migrations of early aftershocks for the 2007 Noto Hanto, Japan, earthquake

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It is crucial importance and challenging of extracting slip behavior on a fault from any earthquake catalogue. The JMA catalogue has been well constructed using continuous waveforms observed by a nationwide permanent seismic network. However, temporal changes in the completeness magnitude threshold of the JMA catalogue are sometimes problematic. Especially, small magnitude earthquakes tended to be masked by overlapping arrivals of waves from different earthquakes and incoherent noises. In order to investigate the high-resolution spatio-temporal variations of foreshocks and early aftershocks of the 2007 Noto Hanto earthquake, we applied a matched-filter technique to detect missing events with the use of continuous three-component velocity seismograms recorded by a dense network of continuous and highly-sensitive seismic stations. We identified three foreshocks within about 12 minutes prior to the initiation of the mainshock rupture. These foreshocks were relocated in the vicinity of the initiation point of the mainshock rupture, where a low-velocity and high-conductive body are imaged by previous studies [Kato et al., 2008; Kato et al., 2011; Yoshimura et al., 2008]. We found out that the newly detected aftershocks migrated in along-strike with logarithmic time since the mainshock origin. The early aftershock migration is significant toward the southwest direction. The post-seismic deformation suggests that afterslip occurred along the source fault plane [Hashimoto et al., 2008]. Thus, the aftershock migration with logarithmic time scale is likely explained by propagating afterslip.