

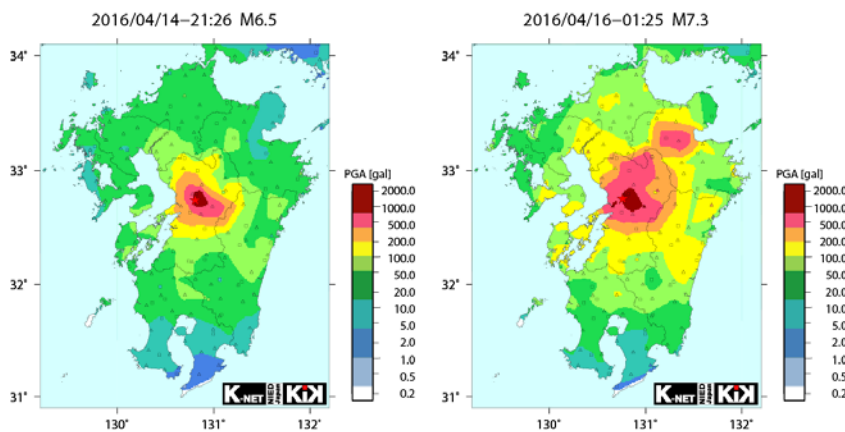
Characteristics of strong motion and source process of the 2016 Kumamoto earthquake sequence

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The 2016 Kumamoto earthquake that is composed of Mw 6.1 and Mw 7.1 earthquakes respectively occurred in the Kumamoto region at 21:26 on April 14 and 28 hours later at 1:25 on April 16, 2016 (JST). These earthquakes are considered to rupture mainly the Hinagu fault zone for the Mw 6.1 event and the Futagawa fault zone for the Mw 7.1 event, respectively, where the Headquarter for Earthquake Research Promotion performed the long-term evaluation as well as seismic hazard assessment prior to the 2016 Kumamoto earthquake. Strong shaking with seismic intensity 7 in the JMA scale were observed at four times in total: Mashiki town for the Mw 6.1 and Mw 7.1 events, Nishihara village for the Mw 7.1 event, and NIED/KiK-net Mashiki (KMMH16) for the Mw 7.1 event. KiK-net Mashiki (KMMH16) recorded peak ground acceleration more than 1000 cm/s/s, and Nishihara village recorded peak ground velocity more than 250 cm/s. Ground motions were observed wider area for the Mw 7.1 event than the Mw 6.1 event. Peak ground accelerations and peak ground velocities of K-NET/KiK-net stations are consistent with the ground motion prediction equations by Si and Midorikawa (1999). Peak ground velocities at longer distance than 200 km attenuate slowly, indicating the effect of long-period Love wave. 5%-damped pseudo spectral velocity of the Mashiki town shows a peak of 1-2 s that exceeds ground motion response of JR Takatori of the 1995 Kobe earthquake and the Kawaguchi town of the 2004 Chuetsu earthquake. 5%-damped pseudo spectral velocity of the Nishihara village shows 350 cm/s peak of 3-4 s that is similar to the several stations in Kathmandu basin by Takai et al. (2016) during the 2015 Gorkha earthquake in Nepal. Ground motions at several stations in Oita exceed the ground motion



prediction equations due to a triggered earthquake by the Mw 7.1 event. Peak ground accelerations of K-NET Yufuin (OIT009) records 90 cm/s/s for the Mw 7.1 event and 723 cm/s/s for the near-by induced event.