

Post-seismic displacements of the 2016 Kumamoto Earthquake by GNSS Campaign measurements

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Since October 1999, seismic activity in the shallow crust of the Futagawa - Hinagu fault zone became active, and in June 2000 an earthquake with a magnitude of 4.8 occurred at the northern end of the Hinagu fault. To clarify the slip in the Hinagu fault and to obtain knowledge about the loading process to the fault, we set eleven observation points (Fig1, KM01 - KM11) on the survey line of about 30 km west-northwest - southeast-west orthogonal to the Hinagu fault of Misato-cho from Uto city. And we began GNSS Campaign observation from 2000 to 2010. At the reference point, we used a wooden precision tripod to fix the antenna and acquired data for 2 to 3 days.

After the Kumamoto earthquake in April 2016, we remeasured the same line. The seismic activity was active during the observation, the tripod deviation did not occur except for some observation points (KM04, 2 mm). For the crustal deformation during the occurrence of the Kumamoto earthquake, crustal deformation of up to 50 cm was observed. Since the amount of displacement is relatively small near the Hinagu fault, it is known that the earthquake fault has not reached the ground surface, dislocation of the fault is within the Northern part of the Hinagu fault on the north side of the survey line, and the underground earthquake fault is close to the sea side by 1 to 2 km from the trace of the active fault which is confirmed on the ground. The middle and southern segments of the Hinagu fault in the southern part of the survey line also proved to be still not moving significantly in this activity.

After the occurrence of the Kumamoto earthquake, the post-seismic displacements is still very active, including the Hinagu fault, and the measurement of the same line for the purpose of investigating post-seismic displacements was conducted in early July 2016 and early July 2017.

In addition, six observation points (KM13 to KM18) were set on the survey line (we called south line) of about 10 km in the northwest - southeast direction orthogonal to the Hinagu fault in Hachikawa town in Yatsushiro at the end of July 2016. We estimate post-seismic displacements from these data.

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Keywords: the 2016 Kumamoto Earthquake, GNSS Campaign measurements, post-seismic displacements

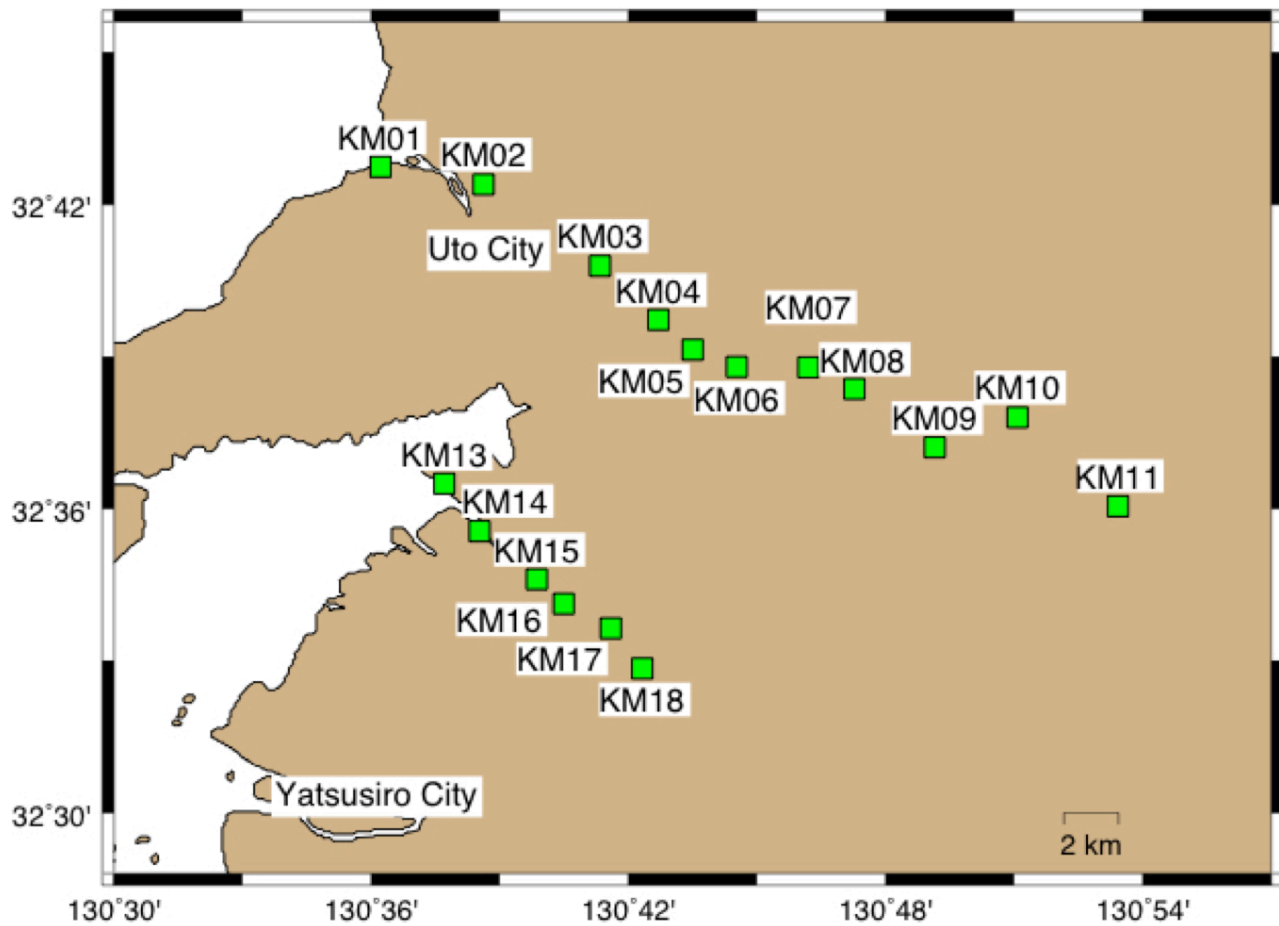


Fig1 Observation network. survey line1(KM01~KM11), survey line2(KM13~KM18)