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Vertical slip rate distribution using high-resolution digital elevation model along the Uemachi fault zone

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The Uemachi fault zone is one of the major reverse fault zones extending the middle of Osaka basin, Japan. Since the fault zone is located the metropolitan Osaka City, it is important to reveal the activity of the fault and seismic potential. The Osaka Formation deposited during the Plio-Quarternary strata widely cover with the Osaka basin. The vertical slip rate of the Uemachi fault has been well determined using the Osaka Formation distributed over the fault zone. On the other hand, the slip rate at one site may have been accelerated at Ma4/6 boundary, ˜600-800 ka, from 0.1 m/ka to 0.4 m/ka. This acceleration during the Quaternary period is essential problem for the definition of active fault and the initiation of on-going fault movement. To address this issue, we revealed the vertical slip distribution along the fault zone, based on 2-m-DEM and terrace deposit. The fluvial terrace during the middle-late Quaternary period are widely distributed at the hanging wall side of the fault zone. Numerous borehole data at the footwall side, that is previously reported, provides the depth of the same horizon as the terrace deposit. These data give the accurate cumulative slip over the faults. As a result, the vertical slip rate distribution exhibits ˜0.6 m/ka along the entire fault zone, and the rate is likely constant along the strike. We further discuss the details of the cumulative slip measurement.

Keywords: active fault, slip rate, Uemachi fault zone, Quaternary, The Osaka Group