

Audio-frequency Magnetotelluric Survey of the Tsuyama-hoppou Fault, Yamasaki Fault Zone, southwest Japan.

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The Yamasaki fault zone (YFZ) is a ~80 km long, typical left-lateral strike-slip fault zone extending WNW from eastern part Okayama prefecture to southeastern part of Hyogo prefecture. The YFZ consists of the Nagisen fault zone, the main part of the YFZ, and the Kusadani Fault. The Nagisen fault zone show different features in fault activity (e.g. general strike, mean slip rate, the latest event) and seismic activity. Fewer earthquakes are occurred around the Nagisen fault zone compared with around the main part of the YFZ, and the Kusadani Fault.

Earthquake Research Committee (2013) reported that the Nagisen fault zone consists of the Nagisen Fault and Tsuyama-hoppou Fault (abbreviated as TYN Fault here after) and Okada *et al.* (2016) further divided the Nagisen Fault into the Koegatawa Fault, Nagiike Fault, and Nagisen Fault (we referred to them as Nagisen Fault Group here after) and reported fault displacement is recognized along the Nagisen Fault Group. While the TYN Fault is classified into the fault of Certainty II and Degree of activity C, and is annotated as “no fault activity after Middle Pleistocene is recognized” (The Research Group for Active Faults of Japan, 1991). That is, the TYN Fault is still an unknown fault and further survey is required. Fukue *et al.* (2018) made a magnetotelluric (MT) survey using an audio-frequency MT (AMT) method, which is suitable for revealing shallow part (0 - 2 km in depth) with high spatial resolution, along the line across the Nagiike and Nagisen Faults, then established the two-dimensional resistivity model (NGS model). They pointed out that the Nagiike Fault is recognized as a clear resistivity boundary but that the Nagisen Fault is not recognized in the model.

Aiming to reveal subsurface structure of the unknown TYN Fault, we made an AMT survey along the line of ~4 km long across the TYN Fault and determined the two-dimensional resistivity model along the line. In this paper, we present outline of observation, procedures of data & model analysis, and the resistivity model, then discuss the subsurface structure of the TYN Fault comparing the NGS model.

Keywords: Yamasaki Fault Zone, Tsuyama-hoppou Fault, active fault, resistivity, Magnetotellurics