Reevaluation of resistivity sturcture beneath the Ohara fault of the Yamasaki fault zone, southwest Japan

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The Yamasaki fault zone (YFZ) consists of the Nagisen fault, the main part of the YFZ, and the Kusadani fault. The main part of the YFZ is further divided into a northwestern (NW) group (the Ohara, Hijima, Yasutomi, and Kuresakatouge faults) and a southeastern (SE) group (the Biwako and Miki faults) based on their latest faulting events and mean slip rates; AD 868 and 1.0 m/kyr for the NW group vs. AD400 - 600 and 0.8 m/kyr for the SE group (Okada, 1987; Earthquake Research Committee, 2013).
Magnetotelluric methods are powerful methods of surveying the subsurface structure of active faults as characteristic electrical conductivity variations are expected around an active fault. Among available methods, the audio-frequency magnetotelluric (AMT) method is useful because of its high spatial resolution for the depth range concerned. Many AMT surveys have been made along lines across the main part of the YFZ, aiming to reveal conductivity structure beneath each faults and relationship between them. Ueda et al. (2010) made an AMT survey along the line (~10 km) across the Ohara fault and proposed the two-dimensional resistivity model. However the model did not delineate resistivity structure well because of wide station spacing and severe artificial noise, so we made an additional AMT survey along the same line and established the new 2D resistivity model (OHR model)
The Ohara model is characterized by one resistive region (R1) and four conductive regions (C1 - C4). Region C1 locates just beneath the surface trace of the Ohara fault, region C2 exists to the northeastern side of the surface trace in depths 0.5 –1.0km, and region C3 is located to southwest of the surface trace and whose top depth is ~1.0 km.
Other two-dimensional resistivity models of the Ohara and Hijima faults have been proposed along two lines; the OHJ model along the line across both the Ohara and Hijima faults (Ueda, 2010) and the HJM model along the line across the Hijima faults (Yamaguchi et al., 2010). Three common features on resistivity structure were recognized; (1) Near surface conductive region commonly recognized just below the surface trace or between two surface traces, (2) Conductive regions are located to the northeastern side of the Ohara fault in depths 0.5 –1.0km, but not to the northeastern side of the Hijima fault, and (3) Conductive regions whose top depth is ~1km are recognized to southwestern side of both the Ohara and Hijima faults.
In this presentation, we outline observation, data analysis, and modelling process, then explain characteristic conductive regions of the newly obtained OHR model. Finally, we show along strike variation of resistivity structure beneath the Ohara and Hijima faults.

Keywords: active fault, resistivity structure, Yamasaki fault zone, Ohra fault, Magnetotelluric method

