

Magnetotelluric imaging of the Itoigawa-Shizuoka Tectonic Line - Kamanashigawa Fault Zone

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We carried out magnetotelluric imaging of the Kamanashigawa Fault Zone, which is one of the southern segments of the Itoigawa-Shizuoka Tectonic Line fault system.

The major objective was to image resistivity structure around the fault system, in special reference to the fault zone geometry.

Our 50km long MT profile runs in the east-west direction from Ina to Kiyosato.

Our frequency ranges were from 300Hz to 1/2000Hz. This profile is designed so that it overlaps the seismic reflection and seismic tomography profiles.

First of all, we have checked the dimensionality of the dataset by Groom-Bailey decompositions. The regional strike above 1Hz shows N30degW, which is consistent with the surface trace of the fault system. However, the lower frequencies show rather N-S strike.

Thus we modeled the resistivity structure in two steps. First, the high frequency data (100-1Hz) were used to image shallow structure (to approx 5km depth) in the N30W coordinate system and the lower frequencies were used to image deeper structure with the N-S strike.

Shallow model show the distribution of thickening conductors underneath the Yastugateke volcano. To the west of the fault, there is a conductor below 2km and it extends westward to MTL. West of the MTL, there is a dipping conductor to the east in the depth range from 0km to 2km.

Deeper model show that the conductor to the west of the fault might continue to a depth of 10-20km.

This conductor coincides with the low velocity anomaly detected by the seismic tomography and the reflective zone detected by seismic reflection profiling.