Heterogeneity of shallow subsurface resistivity structure along Noubi fault system -AMT surveys across Neodani and Umehara faults-

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We investigated shallow subsurface resistivity structures across Neodani and Umehara fault which are components of Noubi fault system by AMT electromagnetic survey. The Noubi fault system is one of large active fault systems in central Japan and considered to be an important research target for research on mechanism of generation and recurrence of inland earthquakes, including processes of strength recovery and stress accumulation in the fault. Generally, resistivity of rock is effective physical property to study underground environmental circumstances, such as temperature, material distribution, existence of fluid, etc.. We may be able to estimate geometry, existence and extent of fracture zone, distribution of fluid and clay minerals associated the fault activities.

Two survey lines of about 2 km length were set at Tarumi region on Neodani fault and at Ijira region on Umehara fault. There ware 20 measuring points along each survey line with interval of about 100 m. The frequency range of two component electric field and three component magnetic field were measured within a frequency range from 0.0001 to 1 Hz by means of instruments developed by Phoenix Co. Ltd.. Data were analyzed into two dimensional subsurface resistivity structures across the two faults by means of an inversion algorithm by Sasaki (1986, 1989).

When 1891 Nobi earthquake occurred, Naodani, Umehara and other active faults forming Noubi fault system were activated, and earthquake surface faults emerged along the active faults. Previous works indicate that the fault activities of the Neodani and Umehara fault are different (e.g., Matsuda, 1974; Mikumo and Ando, 1975; Muramatsu et al., 2002). The surface displacement of strike slip of Neodani fault at 1891 Nobi earthquake was much larger than that of Umehara fault, but the the surface displacements of dip slips of the two faults were nearly the same. The recurrence interval of activation of Umehara fault is much longer than that of Neodani fault. It is important issue whether or not the shallow subsurface resistivity structure s of the two different faults reflect the difference of the two fault activities.