

Resistivity structure beneath the Iide Mountains, Northeast Japan: crustal magma storage beneath Mesozoic crystalline mountains

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Mesozoic crystalline mountains (Iide Mountains) in a non-volcanic region of the Northeast Japan arc were imaged by wide-band magnetotelluric soundings. A two-dimensional model showed that an anomalous conductive body (lower than the value of 10 ohm-m) is clearly visible beneath the Iide Mountains. The conductor widens with increasing depth, and extends from the near-surface down to the base of the crust and perhaps into the upper mantle. Considering several signals imaging the presence of crustal magma storage, such as high-temperature regime, hot spring gases with high $^3\text{He}/^4\text{He}$ ratios of 11.2×10^{-6} (Iide), 9.0×10^{-6} (Awanoyu), thinning of the brittle seismogenic layer and anomalies of low seismic velocity, it is reasonable to suppose that the conductor reflects partial melt and/or high-temperature aqueous fluids in the crust, related to renewed magmatism in the present-day subduction system.