

Late Cenozoic Magmatic Evolutions of the NE Honshu Arc, Japan

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NE Honshu, Japan is one of the typical example of trench-arc-back arc basin system. Combined geological, petrological, and geophysical studies have become a valuable tool in revealing intra-crustal structures of the NE Honshu. Sato et al. (2004) presented a crustal cross-section of NE Honshu arc based on the geology and the deep seismic profiling and recognized two rift systems, the Yamato basin rift system and the northern Honshu rift system. Nishimoto et al. (2005) interpreted that the lower crust of the NE Honshu arc are composed of hornblende bearing mafic rocks based on the laboratory measurements of V_p of the Ichino-megata xenoliths and the seismic velocity structure. And, Nishimoto et al.(2008) have determined the V_p and V_s values of the mafic Ichino-megata xenoliths under high P-T conditions, to use these data in conjunction with the results of seismic tomography for evaluating the petrological characteristics of the heterogeneous lower crust of the NE Honshu arc. Nakajima et al. (2006) have shown the detailed 3D seismic velocity structure estimated by travel-time tomography around Sendai, NE Honshu, and explained the complex velocity structure using its V_p , V_s and Poisson's ratio as Cenozoic sedimentary pile, shallow fluid-rich plutonic rocks under cooling, H₂O-filled vein fractures, mafic plutonic rocks, and partially molten lower crust. The resulted view of crustal structure of NE Honshu is closely related with the Cenozoic tectonic and magmatic evolution of the arc having three prominent stages of volcanic activity; continental margin, back-arc basin, and island-arc stages. We examined the relationship between late Cenozoic magmatic evolutions and the intra-crustal structures of the NE Honshu arc, Japan, and discuss the evolution of the crustal structure in the NE Honshu arc, Japan.

References

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