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## Origin of fluid related to earthquake swarms beneath southeast flank of Ontake volcano, Japan

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Since 1976, earthquake swarms have occurred beneath the southeast flank of Ontake volcano in central Japan. Electrical conductivity surveys have shown that these earthquake swarms are associated with the upwelling of deep-seated fluid (Kasaya et al., 2002, EPS 54, 107-118; Kasaya & Oshiman 2004, EPS 56, 547-552). To investigate the nature of the deep-seated fluid, we have analyzed  $^7\text{Li}/^6\text{Li}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios of water samples collected from natural springs and wells around Ontake volcano in 2000, 2003, 2005, 2007, and 2009. The Li and Sr isotopic compositions of these water samples are largely explained by a binary mixing between near-surface meteoric water and non-surface fluid at each sampling site. On the basis of their Cl/Li and Cl/Sr ratios, we singled out water samples whose Li and Sr isotopic ratios were minimally affected by meteoric water contamination to represent non-surface fluids. The Li and Sr isotopic compositions of most Ontake non-surface fluids, except for samples from the earthquake swarm region, can be explained as the result of volcanic fluids interacting with basement rocks, where they acquired the upper crustal signature. We may attribute the fluid associated with the region of earthquake swarms to the lower crust beneath the study area.

Keywords: deep-crustal fluid, lithium isotope, strontium isotope, earthquake swarm, lower crust, volcanic fluid