After 2014 eruption, The volcanic crustal deformation around Mt. Ontake

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On September 27, 2014, the Mt. Ontake occurred a phreatic eruption. The eruption made fifty-nine casualties and still five missing persons. Because the phreatic eruption makes a smaller signal than a magmatic eruption, a phreatic eruption is harder to predict than a magmatic eruption. For this reason, understanding of the phreatic eruption is essential for the mitigation of volcanic hazard. The observed crustal deformation of Mt.Ontake detected the inflation of the mountain related to the 2007 small eruption. In actually, the NE-SW baseline, which is crossing the Mt. Ontake (Ochiai Karatani - Ontake Tanohara), extended about 2cm at the 2007 event. During 2007 and 2014, the length of the baseline did not change. After the 2014 event, the baseline is contracting about 1cm/yr. The contracting is continue to 2019, and the length of the baseline reaches before 2007 eruption. Also, detected crustal deformation in 2007 event is more extensive region than the 2014 event. Takagi and Onizawa (2016) make two dikes model from observed crustal deformation in 2007 and for the 2014 event two dikes and a small shadow pressure source model. We point out the effect of topography for the shallow source estimation because Takagi and Onizawa (2016) used GNSS observation sites at the foothills where locate over 4km far from the summit of Mt.Ontake. By the way, we developed new five continuous GNSS sites around the foothills of Mt. Ontake after the 2014 eruption and started 11 campaign GNSS observation near the summit region at 2016. The local GNSS observation revealed narrow deformation, which is about 10cm contraction between about 1 km distance GNSS sites from 2017 to 2018. The GNSS sites locate at within about 1km distance from the 2014 crater of Mt.Ontake. The GNSS observation near the summit is essential because the GNSS result suggests the shallow pressure source. The shallow pressure source estimation is affected by topography. In the presentation, we evaluate the topographic effect of the Mountain using three-dimensional Finite element method (FEM). We present the estimate pressure source under considering a topographic effect.

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