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Results of the electromagnetic survey related to the eruption of 2014 on Aso volcano.

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On Aso volcano, eruption was occurred at Nov. 2014, first time in 21 years. Around the Nakadake 1st crater, which is the most active crater of Aso volcano, we conducted continuous geomagnetic field observation (since 1991) and subsurface resistivity monitoring by repeated EM induction survey (since 2011). From these observations, we obtained the data which suggest the subsurface thermal state had drastically changed before the beginning of the eruption.

From the continuous geomagnetic field (total field) observation, significant temporal change was observed. This temporal change began from Oct. 2014, 1 month before the eruption. The sense of this change is demagnetization and it suggests subsurface temperature was increased. From the data analysis, it was revealed that this change in temperature was occurred on 150m depth from the rim of crater, about 50m depth from the bottom of the 1st crater.

From the monitoring of subsurface resistivity using ACTIVE system (control sourced EM induction survey), significant temporal change of resistivity structure was also observed. The repeated ACTIVE survey was carried out on Sep. 20 before the eruption and Nov. 26 just after the eruption. From the data obtained by these surveys, temporal change was observed in 100 to 150m depth from the rim of crater and the resistivity was increased on this depth. The source depth of geomagnetic change and the depth that the resistivity has changed are very similar. From this, we are considering the following scenario: Magma began to rise from before about one month of eruption. By this magma, crustal rock was heated and demagnetized. And the underground water, hydrothermal fluids was pushed away by the high temperature of magma and subsurface resistivity became relatively high.

On our presentation, we will show the detail about our observation data and results of data analysis related to the eruption on 2014.

Keywords: geomagnetic field observation, demagnetization, resistivity monitoring