[EJ] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS08]Active faults and paleoseismology

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Geologic and historic information on seismic cycles and on the magnitude and source faults of past earthquakes is essential information to understand future large earthquakes. The study of past faulting and seismicity is an important issue for an interdisciplinary community of seismologists, geologists, geomorphologists, archaeologists, and historians.

[SSS08-P22]Comparison of GPR survey results and trench survey results at the Matoishibokujo I Fault

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Keywords:GPR survey, trench survey, Matoishibokujo I Fault, the 2016 Kumamoto Earthquake, the northwest of the outer rim of the Aso caldera

Preface: A lot of linear surface displacement derived by the 2016 Kumamoto Earthquake (Mj 7.3) were detected by InSAR analysis around the northwest of the outer rim of the Aso caldera, central Kyushu Island, southwestern Japan, and it is estimated that many of them caused by normal fault deformation of half-graben induced by secondary north-south extension associated with the change of local tectonic stress field (Fujiwara et al., 2016). Although many of them appeared along the known active faults (Kyushu active structure research group ed., 1989; Nakata and Imaizumi, 2002), some of them appeared at the location of no fault displacement topography. Therefore, we are investigating the detail topography, the presence or absence of cumulative displacement and its characteristics in subsurface structure in the two following cases: (1) Linear surface displacements were detected by InSAR along the known active faults, and actual surface displacements were observed at the field as well, (2) Linear surface displacements were detected by InSAR at the location of no fault displacement topography, and actual surface displacements were observed at the field as well. In this presentation, interpretation at the Matoishibokujo I Fault site, which corresponds to the case (1), based on the comparison the result of ground-penetrating radar (GPR) survey and the result of trench survey is reported.

Result &Discussion: Profile of GPR (using Noggin Plus manufactured by Sensors &Software Inc. with the central frequency of 250 MHz) survey at the planned site of trench survey in Matoishibokujo I Fault site showed clear reflecting plane about 3~4 m deep on the south side (subsidence side) of the fault. The reflecting plane was inclined to a deeper part as it approached the fault. This indicates that sedimentary layer (pyroclastic material or alluvium) located on the hanging wall side of half-graben-shaped normal fault pointed out by Fujiwara et al. (2016) is cumulatively subsiding associated with the normal fault movement. As a result of trench survey at the fault part, a pyroclastic layer presumed as Aso-4 pyroclastic flow deposits (89Ka) appeared around 3~4 m deep. Therefore, it is presumed that the clear reflecting plane of the GPR profile corresponds the upper surface of Aso-4. Although the GPR survey could not detect the obvious structure of the fault, there is a possibility that the fault locates at a position where a clear reflection plane corresponding to the pumice layer is disconnected.

Summary and Challenges: As a result of GPR survey across the Matoishibokujo I Fault where surface displacement occurred due to the Kumamoto Earthquake, the sedimentary layer structure inclined toward the fault around 3~4 m deep was detected. The structure indicates cumulatively subsidence associated with the movement of the half-graben-shaped normal fault. I will try to interpret the result of GPR survey in more detail by comparing the detail result of trench survey in the future.

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