[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-P21]A quantitative analysis of the separation distance between interpreted active fault and surface rupture on the 2016 Kumamoto earthquake focusing on slip sense

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The 2016 Mw 7.0 Kumamoto, Japan, earthquake produced surface ruptures along the Futagawa and Hinagu fault zones. This earthquake provides us a significant opportunity to improve the concept of the fault avoidance zone that prevents the damage of human life and property from fault displacement. The objective of this study is to analyze the separation distance between interpreted active fault (IF) and surface rupture (SR) and then to find the important factors that contributed to the significant separation distance.

The surveyed faults are the Futagawa fault and Idenokuchi fault. Right-lateral slip occurred along the Futagawa fault, whereas nomal slip occurred along the Idenokuchi fault at the 2016 event (Kumahara et al., 2016; Shirahama et al., 2016). The IF traces are from a map interpreted by Prof. Chida (Nakata &Imaizumi, 2002) and the SR traces are from Kumahara et al. (2016). After these traces were imported to ArcGIS, only the SR traces were converted to point data every 10 m. We measured the distances of perpendicular lines from the SR point data to the IF traces, and compiled them into the frequency distribution histogram of separation distance between the IF and SR.

The histograms demonstrate the different trends from the ones along the Futagawa fault and Idenokuchi fault. In the Futagawa case, the histogram displays a L-shaped pattern. On the other hands, in the case of the Idenokuchi fault, that it shows an asymptotic decreasing distribution. In a mapview comparison, the SR traces along the Futagawa fault cross the IF traces at some locations, while the SR traces along the Idenokuchi fault are not.

These results indicate that distributed patterns in the histograms depend on fault slip sense: Conjugated and/or echelon map distribution of the SR traces along the Futagawa fault is characterized by right lateral slip, whereas the SR parallel to the IF trances along the Idenokuchi fault is characterized by normal faulting. We thus need to develop a better criterion for the fault avoidance zone taking fault slip sense into account.