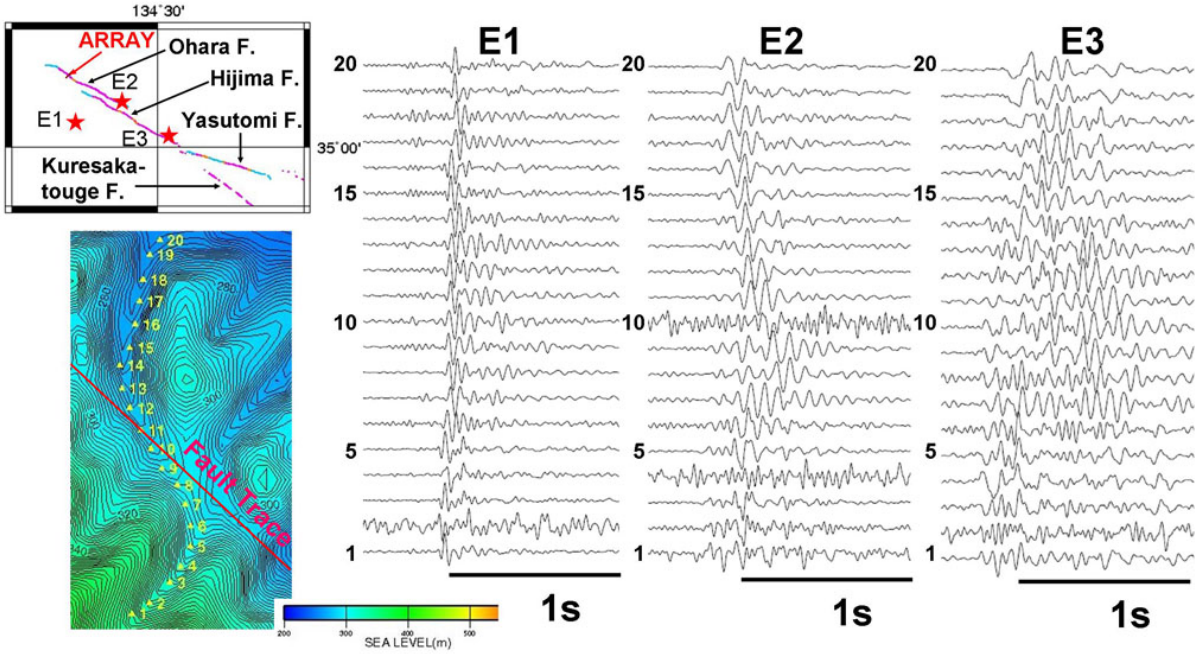
**Japan Geoscience Union Meeting 2010**
(May 23-28 2010 at Makuhari, Chiba, Japan)


SSS021-01 Room: 302 Time: May 27 13:45-14:00

# Characteristics of seismograms observed at linear array across a fault - Detection of trapped waves at Yamasaki fault

Yutaka Mamada[1*], Makoto Hoshino[2], Kin'ya Nishigami[3]

[1]Japan Nuclear Energy Safety Organization, [2]OYO corporation Limited, [3]DPRI, Kyoto Univ.




Japan Nuclear Safety Organization (JNES) has continued several investigations at Yamasaki, which is a typical strike slip fault, since 2007 as a part of project to construct the evaluation method of earthquake source fault. One of the objects in this project is how evaluate the structure around segment boundary. JNES has continued the seismic observation by linear seismic array across Ohara fault, which is one of segment of Yamasaki fault, since 2008. This report shows the observation results focusing on the trapped waves relating with the fault structure, based on the seismograms collected during about 2 years.

Trapped wave is seismic wave propagating along a low velocity zone within a fault. This wave is observed more clearly at position within the low velocity zone along a fault when a source locate in or adjacent to the low velocity zone. The characteristics can be used to detect the fault structure at depth.

The linear array (the length of about 500 meters) across Ohara fault consists of 20 seismic stations with velocity type 3-components seismometers, those intervals are 15 to 45 meters, (see left bottom panel showing station location in the linear array with station number). Each station records continuously with sampling rate of 250 Hz by seismometer with natural frequency of 2 Hz. The seismograms can be collected for the events, these epicenters covered wide area around Yamasaki fault. We show observation results, based on the horizontal seismograms parallel to the surface trace of Yamasaki fault.

Yamasaki fault includes several segments (Ohara, Hijima, Yasutomi, Kuresakatouge and the other

faults) based on the surface traces. These segments are Ohara and Hijima faults from north-west to south-east with small step between two faults. At south-east end of Hijima fault, fault trace separates two traces, which ran east named Yasutomi fault and south-east named Kuresakatouge fault, (see left top panel showing surface traces and three event locations). The seismograms of events occurred around these faults show the common characteristics depending on the event locations as follows: (1) Clear S arrivals appear at all stations when the sources are out of fault zone. And the coda waves following S waves corresponding to trapped waves are not clear (seismograms E1 in right panel), (2) When the sources locate in or adjacent to the fault zone, clear S arrivals and unclear coda waves are found at stations out of fault zone, and unclear S arrivals and clear coda waves at stations within fault zone. The coda waves seem to disperse and it is likely to grow depending on propagation distance (seismograms E2 and E3 in right panel), (3) S arrivals and coda waves are not clear for the events at north-west extension from the Ohara fault trace. Above observation results suggest that trapped waves were successfully recorded and the low velocity zone relating with fault is distributed wide area along Yamasaki fault. Considering the distribution of clear trapped wave and clear S arrivals found on the seismograms within the array, the velocity contrast at north boundary of fault zone are higher than that at south one. And the north-west extension of Ohara fault may have complex structure. The results show these observations have potential to delineate the fault structure around the segment boundary, which probably contribute to the evaluation of fault segmentation.

Keywords: trapped waves, Yamasaki fault, seismic observation by array, segments of fault