

SSS017-P20

Room: Convention Hall

Time: May 25 17:15-18:45

## Seaward extension of the Kikugawa fault zone off Yamaguchi, western Japan

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Estimated time, place, and magnitude of the earthquake are important for mitigation of injury. The magnitude of earthquake is empirically estimated by the length of the fault mapped from topography and/or seismic reflection profile. The distribution of fault on land is revealed by the high-accuracy topography and the air photo. On the contrary, it is difficult to figure out the precise distribution of submarine fault from seismic reflection profile. In this study, Hydrographic and Oceanographic Department, Japan Coast Guard (JOHD) revealed the distribution of the Kikugawa fault zone off Yamaguchi, western Japan from precise seafloor topography obtained with the newest multi beam echo sounder.

The Kikugawa fault zone strikes NW-SE in the western part of Yamaguchi prefecture and is composed of the Kikugawa fault (about 20 km in length) on land and the Kanda-misaki-oki fault (about 20 km in length) in sea. Though it has been estimated that the Kikugawa fault zone would continue more seaward, its northwestern end is not known yet. JOHD conducted the seafloor swath mapping between April and June in 2009 in the extrapolated sea area of the Kikugawa fault zone. Survey vessel "Kaiyo" with KONGSBERG EM302 and "Hayashio" with RESON Seabat7101 were used. Surveyed area was about 4,350 sq km.

Some fault displacements including pull-apart basin, depression with negative flower structure, bulge during faults, and fault scarplet were figured out from the obtained sea floor topography. These displacements are minute but represent the nature of left lateral strike-slip fault movement well. These occur in the extrapolated zone of the Kikugawa fault zone, so they will be an extension of the Kikugawa fault zone. The extension of the Kikugawa fault zone is about 40 km in length. In addition, some valley-like and ridge-like lineaments gently bend the sea floor in the north of the extension of the Kikugawa fault zone. If these lineaments are fold and flexure scarp related to the Kikugawa fault zone, the total length of the Kikugawa fault zone will be over 80 km. On the northeastern side of the Kikugawa fault zone, other fault displacements which strikes NW-SE same as the Kikugawa fault zone were discovered. The relationship between these displacements and the Kikugawa fault zone is not clear, but they would be constructed under the same tectonic condition.

Keywords: the Kikugawa fault zone, seafloor topography, fault displacement