

Active faults and large earthquakes around the Japan Trench

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We investigated feature of active structures around Japan trench based on 3D anaglyph images. There is an extensive reverse fault ca. 500-km long with long anticlinal bulge on its hanging wall in the landward slope of the trench. The accumulated vertical displacement is over 1,000-3,000 meters, which indicates that the active fault has originated very large earthquakes. The 2011 off the Pacific of Tohoku Earthquake (M9.0) was the same as the previous characteristic earthquakes of the active fault. Other submarine active faults are also recognized close to the hypocentral regions of historical large earthquakes. It is essential to examine submarine active faults in order to make an accurate estimate of future large earthquake. According to the relationship between historical earthquakes and submarine active faults, there are two large seismic gaps along Japan trench. We need prepare for large earthquakes that may occur in these regions.

Keywords: submarine active fault, large historical earthquake, tsunami, seismic gap, Japan Trench