

Seismic Attenuation Tomography of Gofar Transform Fault, East Pacific Rise Using OBS Observations

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Gofar transform fault of East Pacific Rise generates M_w 5.5-6 large earthquakes quasi-periodically on some segments of the fault, which are separated by stationary rupture barriers. Earthquakes in the seismic cycle of the large earthquake have clear spatial and temporal evolutions. To better understand the relationship between the earthquake behavior and the physical properties of the fault zone along the strike, Woods Hole Oceanographic Institution deployed a broadband ocean bottom seismograph (OBS) array on Gofar transform fault for 1-year continuous measurements, which successfully captured a M_w 6.0 earthquake on 18 September 2008 and provided an unprecedented dataset. By using t^* values determined from fitting seismic waveform frequency spectrum, we have conducted three-dimensional seismic attenuation tomography to determine along-strike attenuation structure. Combined with the high-resolution earthquake locations and V_p , V_s and V_p/V_s models determined from seismic velocity tomography, we found that the seismicity behavior is mainly controlled by structure heterogeneities along the fault.

Keywords: Gofar transform fault, Seismic attenuation tomography, Structure segmentation