

Thrust-related structural characters of the Morimoto-Togashi Fault revealed by high-resolution shallow seismic reflection profiling

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We collected ca. 7.3 km long, onshore high-resolution two dimensional (2D) seismic reflection and refraction data across the Morimoto-Togashi Fault, active thrust fault within a failed rift system in the Sea of Japan. The processing of the seismic reflection data underpinned by shallow P-wave velocity structures determined from refraction travel time tomography illuminates the detailed subsurface structure to depth of ca. 3 km. The preliminary interpreted depth-converted section correlated with nearby Neogene stratigraphy indicates moderately east-dipping thrust fault plane overlain by monocline comprised by Pliocene to Pliocene sedimentary units. We will mainly discuss (1) the shallow structural characteristics of the active thrust based on our interpretation of the 2D seismic data in combination with the Neogene stratigraphy, (2) fault activity based on growth architecture and fold scarp morphology, and (3) and implications for regional tectonic setting especially associated with reactivation of the failed rift zone. In any case this example successfully shows high-resolution 2D seismic reflection imaging with dense and numerous seismic recorders to be a useful tool in defining otherwise inaccessible active blind faults and their recent fault activity.

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