

Impact of the Friction Along the Subducting Floor at Muroto Transect (SW Japan) on the Formation of the Thrusting Wedge Revealed by Experimental Analogue Models

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Nankai Trough is one of the active tectonic plate margins. It is located geographically south-west of the Japanese Islands Arc. Geologically, it traces the site where the Philippine Sea plate sinks underneath Southwest Japan. This zone has recorded large earthquakes ($M = 8$) and may generate more hazardous ones in the future.

Simulation of the geological structure developed in this part of the Nankai Trough using scaled analogue models was based on the friction variation from northwest to southeast. Three experiments of high, medium and low friction floor were performed. Based on results of the previous experiments and referring to seismic data acquired at Muroto Transect, a final scaled model similar to the seismic section was successfully reproduced.

Results of this research show clearly the great influence of the friction along the subducting floor on the style of the deformation and the type of the geological structures developed in the sediment pile accumulated in the accretionary prism. High friction material imposes the development of low angle thrusting wedges with the least spacing and the highest relief, which was interpreted to be the equivalent of the low landward-dipping reflector of the seismic section. Medium basal friction lead to the development of large scale thrust faults. This zone corresponds to the large thrust-slice zone of the above cited section. With low basal friction, imbricate thrust faults was developed in an organized thrust succession; which was interpreted as the imbricate thrust zone of the seismic section.

Keywords: Analog modeling, Nankai Trough, Muroto Transect, Subducting zone, Japan