

Structural geology of the hanging wall of a seismogenic splay fault -results from Exp 315 to the Nankai Trough

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The main objectives of Stage 1 of the IODP Nankai Trough Seismogenic Zone Experiment (NantroSEIZE) was to characterize the geometry, kinematics and dynamics of the accreted materials above and in front of the seismogenic decollement in preparation for deep drilling in 2009. Expedition 315 (the second of three Stage 1 expeditions) was planned to provide the first information on the composition and structural architecture of the hanging wall of a major splay fault associated with the decollement that, based on the inversion of tsunami and seismic waveforms, may be seismogenic.

Two sites were drilled during Expedition 315; one site was in upper prism and sampled the hanging wall of the splay fault whereas the second was in the Kumano Basin. The hanging wall site penetrated 450 m of slope and accreted materials and the basin site penetrated over 1000 m of shelf and accreted sediments. Preliminary structural analyses from these two sites suggest the reorientation of strain axes in both space and time. Across the margin, strain reorients from trench-orthogonal compression, to trench-parallel extension above the splay fault, to nearly trench-orthogonal extension in the forearc and below. Limited cross-cutting relations observed in the cores also suggest that these permutations are recorded over geological time as the material migrates from the upper wedge to the forearc domain.