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# The 3D structure of the Nankai subduction zone splay fault along the NanTroSEIZE Kumano transect

**N. L. Bangs** (1), G. F. Moore (2), T. Yoro (3), H. Tanaka (3), S. Uraki (2), S. Kuramoto (2), E. M. Pangborn (1), H. J. Tobin (4)

(1) Institute for Geophysics, University of Texas, (2) Center for Deep Earth Exploration (CDEX)/JAMSTEC, (3) JAPEX Overseas Exploration, (4) University of Wisconsin

In April-May 2006 we acquired new 3-D seismic reflection data across the Nankai subduction zone of southwestern Japan along the IODP NanTroSEIZE transect. The data image the subduction zone thrust system, including a major splay fault believed to have slipped in the most recent, 1944, mega-thrust earthquake. We acquired the 3-D data with Petroleum GeoServices (PGS) on the S/V Nordic Explorer using four 4,500 m streamers with 150 m separation and two 3090 $in^3$ sources firing alternately at 37.5 m intervals. Compagnie Générale de Géophysique (CGG) processed these data through pre-stack time migration. The 3-D data cover 12 x 56 $km^2$ across the Kumono basin and the accretionary wedge to within 4 km of the deformation front.

We have mapped the 3D geometry and seismic reflection amplitudes of the active splay fault that forms beneath the upper slope of the accretionary wedge and the Kumano basin. The deepest splay fault segment lies at the northern, landward edge of the survey. There it forms a continuous surface in both dip and strike directions with a high-amplitude reversed-polarity (polarity opposite the seafloor) reflection $\sim$1 km above the subducting ocean crust. Across the survey, the splay fault rises from $\sim$10 km to $\sim$6 km sub-seafloor beneath the seaward edge of the Kumano basin where it branches into 3 main splays, and numerous smaller ones, that we trace to $\sim$100 m below the seafloor. Lateral ramps with significant WNW dip, perpendicular to convergence, develop within the lower slope splays while the upper slope splay segments have little to no dip perpendicular to convergence. The upper slope splay segments have reversed-polarity reflections. We speculate that the landward splays are the most active during recent slip. The geometry and physical properties of these faults have a significant impact on up dip rupture propagation following major earthquakes.