[EE] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS04]Nankai Trough Seismogenic Zone Experiment toward the final challenge

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
The Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) is a multidisciplinary investigation of fault mechanics and seismogenesis along the megathrust at the Nankai Trough subduction zone, and includes reflection and refraction seismic imaging, direct sampling by drilling, in situ measurements, and long-term monitoring in conjunction with laboratory and numerical modeling studies. During the past 11 IODP expeditions off Kii Peninsula since 2007, 15 sites have been drilled by D/V "Chikyu" down to depths from 100s of meters to more than 3000 meters below seafloor, where the inner and outer wedge of the Nankai margin has been sampled extensively, and two state-of-the-art real-time downhole observatories are now in operation. NanTroSEIZE is now at the final stage with only two more expeditions planned for another downhole observatory installation at the toe site in early 2018, and for resuming riser drilling toward the megathrust at ~5200 meters below seafloor starting from late 2018.
In this session jointly held with AOGS, we expect presentations on scientific outcomes from the NanTroSEIZE project and discussions toward the final challenge. We welcome presentations on, but are not limited to, seismic imaging, borehole logging and monitoring, chemical analyses of pore water and mud gas, lithology, structures, physical properties and laboratory experiments of cuttings and core samples, and theoretical and numerical modeling.

[SSS04-P01]Offshore receiver function imaging of the Philippine Sea Plate in the Nankai subduction zone

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We show receiver function (RF) images around the Nankai subduction zone, using a cabled seafloor network (DONET: Dense Oceanfloor Network System for Earthquake and Tsunamis) and seismometers deployed at two boreholes. DONET contains 22 stations in DONET1 (eastern network) and 29 stations in DONET2 (western network), and their observation periods exceed more than 6 years and 1.8 years, respectively. In this study, we collected teleseismic P waves from records observed at the 53 (22 + 29 + 2 borehole stations), and applied a RF analysis to retrieve P-to-s converted waves. To convert time- to depth-domain RFs, we used shear velocity models obtained from a Rayleigh admittance analysis (Tonegawa et al. 2017), which describe shallow velocity structure at the accretionary prism. As a result, we obtained RF images that show the top of oceanic crust at depths shallower than 10 km beneath the southern part of DONET1. These are consistent with reflectors obtained from previous studies (e.g., Kamei et al. 2012). At the northern part of DONET1, RF images show strong Ps amplitudes at depths of 10–25 km. These may also correspond to the top of the oceanic crust. For DONET2, since the number of available teleseismic P waves was small due to the short observation period, we could detect clear Ps amplitudes only at shallow depths.