Oral | Symbol S (Solid Earth Sciences) | S-SS Seismology

[S-SS30_28AM2]New perspective of great earthquakes along subduction zones

Convener:*Kyuichi Kanagawa(Graduate School of Science, Chiba University), Takashi Furumura(Center for Integrated Disaster Information Research (CIDIR) Interfaculty Initiative in Information Studies, The University of Tokyo), Shuichi Kodaira(Institute for Research on Earth Evolution Japan Agency for Marine-Earth Science and Technology), Masanobu Shishikura(Active Fault and Earthquake Research Center, GSJ/AIST), Chair:Saneatsu Saito(Japan Agency for Marine-Earth Science and Technology)
Mon. Apr 28, 2014 11:00 AM - 12:42 PM Main Hall (1F)
We explore a new perspective of great earthquakes along subduction zones by integrating results of historical earthquake and tsunami surveys, seismic and geodetic observations and experiments, laboratory experiments, material analyses, and numerical modeling on pre- and co-seismic processes and slips, seismic links, and the recurrence. We welcome presentations not only on great earthquakes along Japan Trench, Nankai Trough, and other subduction zones in the world, but also on their precursory or inducing large inland earthquakes.

11:00 AM - 11:15 AM

[SSS30-P16_PG]Three-dimensional velocity model for the Nankai Trough seismogenic zone based on structural studies

3-min talk in an oral session

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Coseismic rupture area of the great interplate earthquake concerned about its occurrence along the Nankai Trough presumed by government of Japan is now wider to the west, north and south than the former assumption. Although the new estimation is based on seafloor topography, source area of the past largest megathrust event, present seismic activity and so on, structural information has not always been enough reflected yet. In order to estimate precise coseismic rupture area of the Nankai megathrust earthquake, it is necessary to improve a physical model of the Nankai Trough seismogenic zone based on the geometry of the subducting plate and velocity structure model.Japan Agency for Marine-Earth Science and Technology had conducted the large-scale high-resolution wide-angle and reflection seismic survey and long-term observation from off Kyushu to Tokai between 2008 and 2012. Layered velocity structure models are now obtained along grid two-dimensional seismic profiles from the Hyuga-nada to the Kii channel area. A three-dimensional seismic tomography using active and passive seismic data observed both land and ocean bottom stations had been also performed for the western Nankai Trough. In this study, we constructed a three-dimensional velocity model of the Nankai Trough with the procedure as follows;1) Sampling the velocity structural information along each seismic profile with interval of ~1km in horizontal, and ~100m in vertical directions2) Preparing the geometry model of each interface included in layered models, e.g., basement, plate boundary, Moho, etc.3) Setting minimum and maximum velocities of each layer based on the velocity models along two-dimensional seismic profiles 4) Interpolating sampled velocity information considering layered structure (Landmark DecisionSpaceDesktop is used for constructing 3-D modeling)Previously published layered models are also used to make up for insufficient structural information for the eastern Nankai Trough.Reliability of the three-dimensional model was confirmed by comparing calculated travel-times with observed travel-times along each seismic profile. We will also try to evaluate the reliability of the model by comparing the

hypocenter distribution using three-dimensional velocity model obtained in this study with that determined by three-dimensional seismic tomography using active and passive source data. We will plan to revise our 3D model with additional structural information and construct more precise and detailed model for the entire Nankai Trough area so that the model can be applied to more realistic numerical simulation.This study is part of 'Research concerning Interaction Between the Tokai, Tonankai and Nankai Earthquakes (FY2008-2012)' funded by Ministry of Education, Culture, Sports, Science and Technology, Japan.