[JJ] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG61]Ocean Floor Geoscience

convener:Kyoko Okino(Atmosphere and Ocean Research Institute, The University of Tokyo)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Most of Earth's volcanism and much of its tectonic activity occur on and beneath the seafloor. Various phenomena on the seafloor are closely linked to plate tectonics, Earth structure and dynamics, and also related to Earth's environments through the hydrosphere and atmosphere. Seafloor rocks and sediments record Earth's evolution and heat and material fluxes on the Earth. Ocean Floor Geoscience session covers a broad range of research on seafloor such as mid-ocean ridge process, subduction dynamics, arc magmatism, hot spot and LIPs, crustal movement and structure etc. Every field of researches and every approaches are welcomed. The session aims to encourage discussion among scientists from different study fields and to integrate our understanding of ocean floor. The session is co-dhaired by K. Tadokoro (Nagoya Univ.), O. Ishizuka (AIST), T. Toki (Univ. Ryukyu), and N. Takahashi (JAMSTEC).

[SCG61-P09]Distribution and characteristics of the sedimentary basins under the slope between the East China Sea shelf and the northern Okinawa Trough

*Chiaki Okada[1], Azusa Nishizawa[1], Kentaro Kaneda[1], Mitsuhiro Oikawa[1], Daishi Horiuchi[1], Yukari Fujioka[1], Kohsaku Arai[2] (1.Japan Coast Guard, Hydrographic and Oceanographic Department, 2.Research Institute of Geology and Geoinformation, Geological Survey of Japan)
Keywords:Okinawa Trough, continental rifting, sedimentary structure, Multi-channel seismic reflection survey

The Okinawa Trough, an active backarc basin of the Ryukyu (Nansei-Shoto) island arc-trench system, is oriented generally NE-SW direction extending from SW Kyushu, Japan to the northern Taiwan. The trough is considered to be in the stage of the continental rifting caused by the subduction of the Philippine Sea plate under the Eurasian plate and the crustal extension beneath the trough is in progress. The geological structure around the East China Sea composes of several pairs of sedimentary basins and uplift zones. The rifting period of these sedimentary basins becomes younger as the rifting migrated southeastward from the East China Sea shelf to the Ryukyu Trench. The rifting stage of the Okinawa Trough is divided into two phases. The crustal extension during the first phase had occurred under the slope between the East China Sea shelf and the western edge of the Okinawa Trough and the mainly active position for the second phase exists in the present Okinawa Trough. Investigating the previous rifting style provides an important clue to understand present tectonics around the Okinawa Trough in detail.
In this report, we compare three multi-channel seismic reflection (MCS) profiles conducted in the northern Okinawa Trough by Japan Coast Guard and reveal the distribution and the development history of the sedimentary basins and the uplift zones beneath the slope between the East China Sea shelf and the western margin of the Okinawa Trough. The NW-SE trending seismic lines are designed to be perpendicular to the trough strike.
As a common feature to three survey lines, large-scale half-graben structures created by NW-dip normal faults were confirmed beneath the slope. On each seismic line, MCS profiles represent the existence of two or three grabens under the slope. The sedimentary thickness to fill these grabens is 5-8 km. We also identified that at least two unconformities characterized by strong reflectors in the sedimentary basins.

The series of these sedimentary basins beneath the slope corresponds to the "the sedimentary basin under Tunghai Slope" proposed by Kimura (1990) or “Ho basin” in Lin et al. (2005), and we found that the same kind of basins extends to the northernmost Okinawa Trough.
When compared the characteristics of these sedimentary basins below the slope along the N-S direction in the survey area, the basin bottoms in the northernmost seismic profile become deeper and the number of the basins is fewer than in the southern profile. Therefore, the northwestern Okinawa trough may be affected by a stronger extensional stress locally.
Inside the graben structure below the slope, we found that several normal faults to cut the sedimentary layers filled in the graben structure. But since it is fewer faults to reach the sea bottom compared with in the sedimentary layers around the center of the Okinawa Trough, this suggests the current activity of the basin below the slope is not high, compared with the faulting activity in the trough.
The basement high corresponding to the Goto-Senkaku uplift zone to the northwest of “the sedimentary basin under the Tunghai Slope”, the eastern edge of the East China Sea shelf, was clearly identified on all survey lines. The top of this basement is rugged and covered with a horizontally layered sedimentary stratum of about 1 km thickness. According to the uplift zones below the slope between the sedimentary basins and the Okinawa Trough, we confirmed several basement highs to the southeast of “the sedimentary basin under the Tunghai Slope”. However it’s difficult to trace the uplift zone continuity in the N-S direction along the western margin of the trough with only three MCS profiles.