Oral | Symbol S (Solid Earth Sciences) | S-CG Complex & General

[S-CG67_2AM2]Ocean Floor Geoscience

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Fri. May 2, 2014 11:00 AM - 12:45 PM 418 (4F)

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.

12:00 PM - 12:15 PM

[SCG67-P18_PG]Evolution of depositional basin accompanied by recurring caldera collapses in Kikai caldera, southern-off Kyushu, Japan

3-min talk in an oral session

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Kikai caldera (Matsumoto, 1943) is a mostly submerged highly active caldera volcano located in 40 km off Kyushu Island. The caldera is recognized as the product of 7300 cal. BP super-colossal eruption with Akahoya tephra (Machida and Arai, 1978; Fukuzawa, 1995) which is widely distributed along the western part of Japan. Previous studies for near-vent onshore geology strongly suggests such a large eruption was not occurred only once, but multiple times in the Kikai caldera (Ono et al., 1982).In Kikai caldera, 24 lines of multi-channeled seismic reflection surveys were held in two survey cruises (KT-10-18 and KT-11-11) in 2010 and 2011 using R/V Tansei-maru of JAMSTEC (Japan Agency for Marine-Earth Science and Technology). The acquired seismic data for subseafloor structures spotted thick sedimentary basin at the eastern margin of the caldera. The basin covers 70 square km of the 20 km-wide caldera and is next to caldera rim fault. The infill of the basin is characterized by the group of onlapping stratified deposits named B which maximum thickness is more than 600 m. The B-sequence has two major depositional discontinuities in the middle and the top. The lower one is paraconformity and the upper one is disconformity though, the both of them are associated with similar deformation of the basin itself. The deformation is characterized by 1. Dragged-up reflectors along the caldera rim fault, and 2. Slight outward rotation of the deposits. Both characteristics intensify along the depth, which means lower deposits were experienced much more deformation.The both two types of the deformation suggest the basin was experienced at least two major subsidence event. The former dragged-up structure is interpreted as the incomplete slip of the caldera rim fault for the relief of the subsidence, while the latter rotation shows the slippages were slightly listric. The displacements of the subsidence events

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could be estimated from the top and bottom of the dragged-up structures, as more than 100 m in the lower-older event and more than 50 m in the upper-newer event. The subsidence would be an abrupt event, as the paraconformity was formed in the lower-older event. The most likely candidate for such a significant subsidence is caldera collapse. As therefore, the basin might be the one of the pre-caldera structure, and it has been experienced multiple caldera collapse events in the past.

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