Reflection seismic survey data around ring structures of the submarine Kikai Caldera, south offshore Kyushu, Japan

*Jih-Hsin Chang[1], Takahiko Inoue[1], Ayanori Misawa[1], Kohsaku Arai[1]

1. Geological Survey of Japan, National Institute of Advanced Industrial and Science Technology.

Records of volcanic activities may be destroyed by successive explosion especially at center part of caldera and it is thus of great significance to investigate the volcanic history through the volcanic structures around the caldera. Kikai caldera is rhyolitic caldera located at south offshore Kyushu, lying on the volcanic front of the subduction zone of Philippine Sea plate at Nankai trough and Ryukyu trench. It is bounded by the Takeshima island and Satsuma Iwojima island as subaerial parts of a ring structure of caldera to the north and west, and submarine double ring faults to the south and east, representing a trapdoor (asymmetrical) morphology of the caldera. Using reflection seismic data across the Kikai Caldera collected in 80s and archived in Geological Survey of Japan, we investigated the ring structure around the Kikai Caldera.

North of the northern ring structure, a bathymetric bulge is recognized and shows a gentle convex shape on reflection seismic profiles. It is likely to represent the tumescence of the Kikai activities. Beneath the bathymetric bulge, a relatively flat and eastward dipping surface is clearly shown. The formation of this surface is likely to provide us a key to evaluate the of most recent activities of the Kikai Caldera. South of the south ring structure, a funnel-shaped feature is recognized in our reflection seismic data. Based on field perception from Miyakejima Volcano, we interpreted it as a volcanic crater associated structure, probably indicating a phreatomagmatic explosion controlled by the lateral evolution of a feeder dike.

Keywords: Reflection seismic data, Kikai caldera

