Cruise Summary

1. Cruise Information

● Cruise ID: KH-21-3

● Name of vessel: Hakuho-maru

● Title of cruise:

Leg. 1: Marine and earth science surveys in the southern part of the Okinawa Trough

Leg. 2: Preliminary survey conducted in the northern East China Sea for IODP proposal to understand the history of the Asian monsoon system

● Chief Scientist [Affiliation]: Makoto Otsubo (Geological Survey of Japan/AIST)

● Cruise period: 23th January 2021 – 8th February 2021

●Ports of departure / call / arrival: Naha - Tokyo

● Research area: Southern part of Okinawa Trough (Leg1) and Danjo Basin (Leg 2)

○ Research map

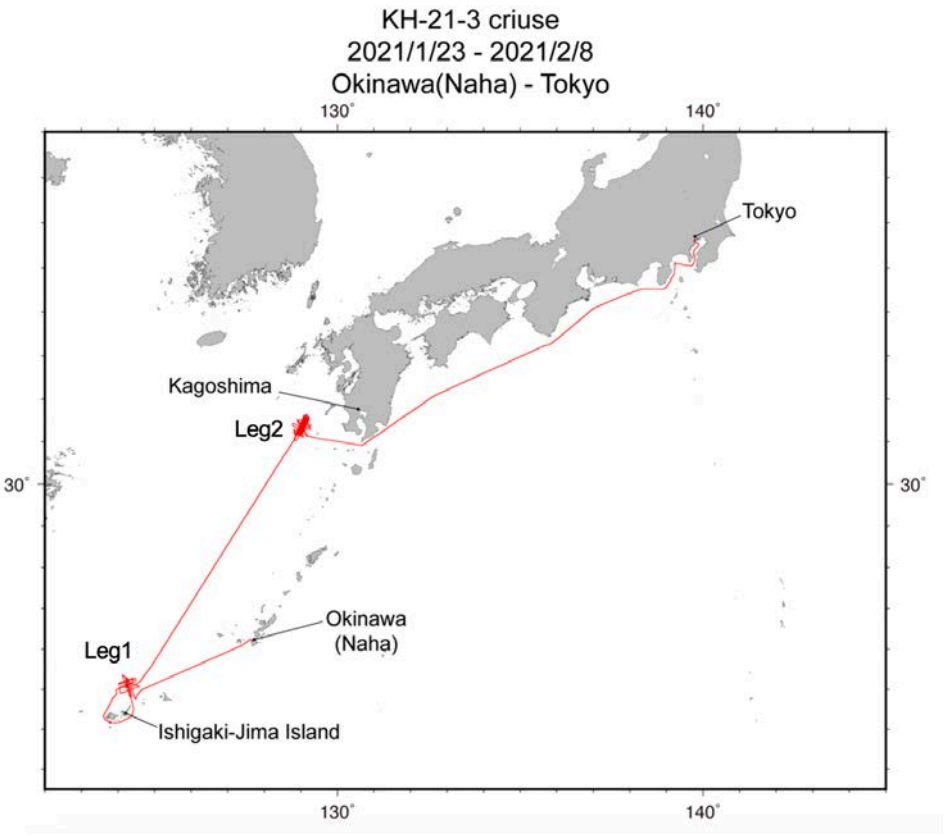

Fig.1 Survey Track of KH-21-3 cruise

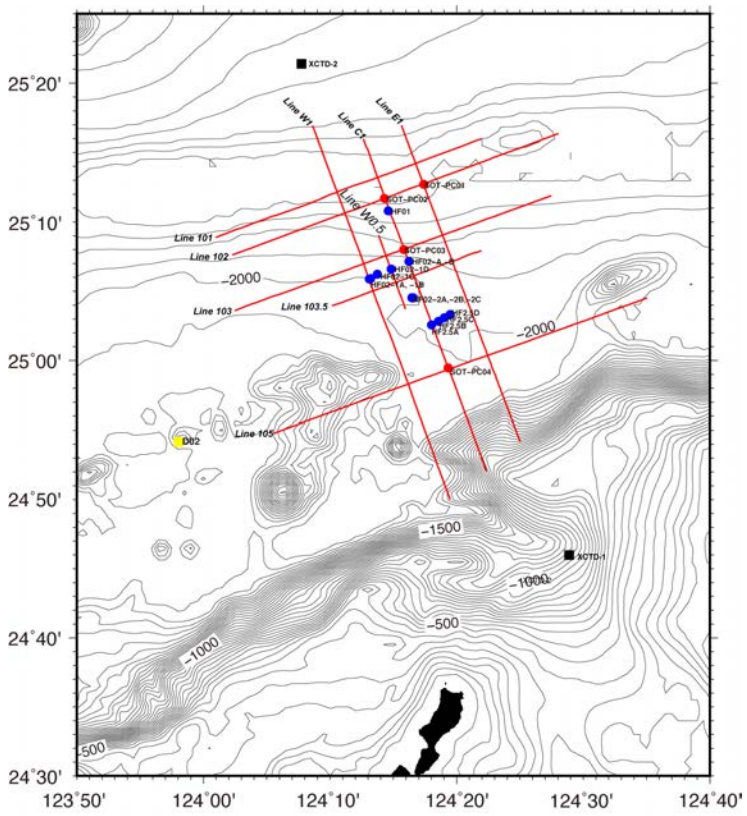

Fig.2 Survey map of KH-21-3 cruise Leg 1

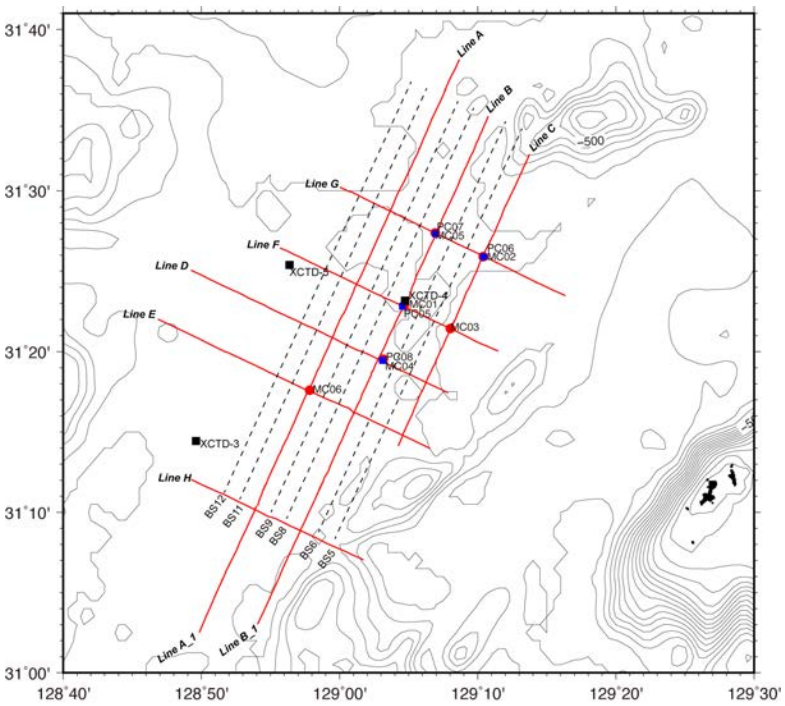

Fig.3 Survey map of KH-21-3 cruise Leg 2

○ Title of proposal：

[Leg 1] Marine and earth science surveys in the southern part of the Okinawa Trough

[Leg 2] Preliminary survey conducted in the northern East China Sea for IODP proposal to understand the history of the Asian monsoon system

● Representative of Science Party [Affiliation]

Makoto Otsubo (Geological Survey of Japan/AIST), Yoshimi Kubota (National Museum of Nature and Science), Ayanori Misawa (Geological Survey of Japan/AIST), Ken Ikehara (Geological Survey of Japan/AIST), Saki Ishino (Geological Survey of Japan/AIST), Masataka Kinoshita (The University of Tokyo, ERI), Kenji Matsuzaki (The University of Tokyo, AORI), Katsura Kameo (The University of Tokyo, AORI), Chiori Tamura (The University of Tokyo, AORI), Ryuta Arai (JAMSTEC), Tomohiro Toki (University of Ryukyus), Yuki Mitsudome (University of Ryukyus), Zhirong Cai (Kyoto University), Keiko Takehara (Kochi University), Kodai Kato (Kochi University), Daisuke Kuwano (Chiba University), Koshiro Matsuo (Kyushu University), Keita Suzuki (Nippon Marine Enterprises, Ltd.), Misaki Horiuchi (Nippon Marine Enterprises, Ltd.), Yohei Katayama (Marine Works Japan, Ltd.), Satoshi Okumura (MOL Marine Co., Ltd.)

2. Overview of Research Activities

● (Individual activity title)

[KH-21-3 cruise Leg 1]

The Okinawa Trough is a back-arc basin located on the Eurasian plate, and has been undergoing rifting since 2 Ma. Especially, the rifting in the southern part of the Okinawa Trough started about 0.1 Ma, but there are still no reports of basaltic oceanic crust. In the KH-21-3 cruise Leg 1, we find the detailed normal faults that construct the graben, the lithology and age of sediments that filled the graben, the heat flow and rocks in the knoll to understand the geohistory from Quaternary to present on the Okinawa Trough.

In KH-21-3 cruise Leg 1, we conducted the seismic reflection survey, subbottom profiler (SBP) survey, swath bathymetry suevey, gravity mesurement, magnetic measurement, XCTD observations, piston coring, rock sampling by dredge, heat flow measurements and plankton sampling in the southern part of the Okinawa Trough.

[KH-21-3 cruise Leg 2]

The northern part of the East China Sea has large salt fluctuations in summer, and the IODP site U1429 (Danjo Basin) is an important site for elucidating the history of changes in the Asian monsoon. However, the coring at U1429 in 2013 was blocked by a sand layer (thickness unknown) at a depth of 200 m below seafloor. Therefore, in the KH-21-3 cruise Leg 2, in order to extract the effective drilling sites, we investigate the geological structures in the southeastern part of the U1429 site.

In KH-21-3 cruise Leg 2, we conducted the seismic reflection survey, piston coring, seafloor surface sediment sampling using multiple coring, SBP survey, swath bathymetry survey, gravity mesurement, magnetic measurement, and XCTD observations and plankton sampling in the Danjo Basin.