Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)
©2015. Japan Geoscience Union. All Rights Reserved.

SGL37-01 Room:103 Time:May 24 14:15-14:30

Tectonic features around the Abukuma ridge and their relationship with tectonic framework of the Northeastern Japan Arc

ARATO, Hiroyuki[1*] ; CHIYONOBU, Shun[1]

[1]Faculty of International Resource Sciences, Akita University

The Abukuma rigde is a significant buried uplift zone bordering the east of southernmost part of the forearc basin extending from the central axial Hokkaido through offshore Shimokita and Kitakami to offshore Joban area in the Pacific side of northeast Japan.

Its tectonic characteristics and formation mechanisms might be decisive information to elucidate not only geotectonic framework of the Northeastern Japan Arc but spreading processes of the northern portion of Japan Sea.

In order to do so, following items must be clarified by the seismic dataset and well geological information at the Abukuma ridge and its adjacent area: i) structural geological characteristics of fault groups and folds, ii) their extending trend and direction, and iii) sedimentological and stratigraphic relationship of erosional or starved discontinuous surfaces.

Accordingly the authors are conducting re-interpretation of the following seismic surveys: i) approximately 2,000 square kilometers ”Southern Abukuma ridge” three-dimensional seismic data acquired by METI in 2009, and ii) approximately 2,500 kilometers ”Offshore Southern Sanriku and Kashima” two-dimensional seismic data acquired by MITI in 1986.

Three MITI wells, moreover, ”Kesennuma-oki,” ”Soma-oki” and ”Joban-oki,” and several commercial exploratory wells had been drilled in the above mentioned waters. The ”Kesennuma-oki” well, spudded in 1984, had drilled thick upper Cretaceous section and reached early Cretaceous granite basement at the total depth of 2,027.00 meter. The ”Soma-oki” well, spudded in 1990, had drilled Neogene and Paleogene successions and reached upper Cretaceous at the total depth of 3,500.00 meter. The ”Joban-oki” well, spudded in 1991, had drilled thick lower Miocene and upper Cretaceous overlain by relatively thin middle to late Miocene and Quaternary sediments, and confirmed Turonian at the total depth of 3,170.00 meter. Geological information from those wells are utilized as chronostratigraphic and lithostratigraphic controls for the seismic interpretation.

It became gradually clear as tentative results of the interpretation that:

i) the above mentioned forearc basin in the studied area may be subdivided into a few portions by several structural lineations characterized by strike-slip components, ii) the basin therefore may not have simple north-south elongated geometry, iii) such lineations are possibly continuous with some geologic tectonic lines or geotectonic discontinuities specified by subaerial geological descriptions in the northeast Japan, on the basis of their location and direction, and iv) several groups of a number of faults, identified at the southern part of Abukuma ridge in the 3D seismic dataset, may possibly be interpreted as a record for stress field directions of each geologic age.

Keywords: Abukuma ridge, offshore Miyagi Prefecture, offshore Fukushima Prefecture, Northeastern Japan Arc