

Initial report on the 2009 Deep Seismic Profiling "Kitamino 2009" in the North-Mino district, NW part of Central Japan

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The Deep Seismic Profiling "Kitamino 2009" was successfully made from September 30 to October 20 in 2009 in cooperation with the National Research Center for Disaster Prevention (NIED) in the Northern Mino district, Northwestern part of Central Japan, beneath which the upper surface of the Philippine Sea Plate (PHS) forms a broad anticline-like structure with a NW-plunging hinge. The location of the hinge seems to correspond to the biggest hinge in the megakink structure of the Mino belt, which was formed in association with the bending of the Japanese island arc during the middle Miocene. Furthermore the trace of the Yanagase fault, a major active fault in the Central Japan, is running close to the biggest hinge in the megakink structure, whereas the trace of the Neodani fault, another major active fault, is also along the one of the hinges. This correspondence among three kinds of the structures mentioned above suggests essential relationship between the subducting PHS and the overlying crustal structures in the northwestern part of Central Japan. Thus the "Kitamino 2009" was aimed to reveal the whole crustal structure and the geometry of the upper surface of the PHS.

In order to accomplish the aim a 90-km long seismic line was set up from Yogo Town, Shiga Pref. to Gujyo City, Gifu Pref. crossing at high angle with the trend of the three kinds of structures mentioned above. The line was composed of two segments, E-W trending western and NE-SW eastern segments, for the purpose of quasi-3-dimensional processing. 8 dynamite shots (100kg, 200kg) and 2 Vibroseis shots (280, 300 sweeps) were used as powerful sources, and 10-Hz receivers were arranged at about 50-m intervals. Recording times were 30 sec for vibroseis shot and 64 sec for dynamite shot. Satisfactory data sets were obtained at high S/N in the nighttime.

Following significant results are provided, although the processing is still in progress.

- 1) A predominant deep reflective zone is traceable from the western to the eastern ends of the seismic line. As it occurs at TWT 9 - 11 sec in the west segment, and at TWT 10 - 12 sec in the east segment, it dips at about 10 degrees eastward.
- 2) A fairly reflective zone with 1-to-2 sec thick is recognized in places at 2 sec beneath the deep reflective zone mentioned in 1).
- 3) Above the deep reflective zone, notable reflectors also occur at 3, 4 to 5, and 8 sec, which are expected to be useful to reveal geological structures in the crust.

Keywords: Central Japan, crustal structure, Seismic Reflection Survey, Kita-Mino, Philippine Sea Plate