Structure of the Hidaka Main Thrust in the southernmost part of the Hidaka collision zone, by Super deep Hidaka 2000

Shinsuke Kikuchi[1], Katsuko Suzuki[2], Tanio Ito[3], Noriko Tsumura[4], Kazunori Arita[5], Takeo Moriya[5], Hideo Saito[6], Taku Kawanaka[6], Takeshi Kozawa[6], Takeshi Ikawa[6]

[1] Grad.School Sci.&Tech.,Chiba Univ., [2] Grad. School Sci.&Tech.,Chiba Univ., [3] Dept. Earth Sciences, Fac. Sci., Chiba Univ., [4] Fac.Sci., Chiba Univ., [5] Earth and Planetary Sci., Hokkaido Univ., [6] JGI

Introduction

The Kuril arc has been colliding with the Northeast Japan arc forming the Hidaka Collision Zone (HCZ) along the HIdaka mountain range. Recent deep seismic reflection studies (Hidaka94,96,97) have revealed (1) the Kuril arc is delaminated at about 23km deep in the lower crust, (2) the upper part of the Kuril arc crust (upper crust + upper portion of the lower crust) thrusts over the Northeast Japan arc along the Hidaka Main Thrust (HMT), (3) The geometry of HMT is listric in shape, (high angle near the surface and gentle to subhorizontal at depth).

On the contrary the HMT seems to be at low angle in the southernmost of the HCZ. The precise subsurface structure of the HMT,however,was still unknown. Thus, the new experiment, Super deep Hidaka 2000, was conducted in the southernmost part of the HCZ with the following spercifications.

Super deep Hidaka 2000

Source: 5 Vibroseises, Sweep frequency: 8-30Hz, Sweep length: 24s, Summation: 30, Shot interval: 300m Receiver interval: 50m, Seismic line: Line1: NW-SE direction, 22km,Total SP: 53ch, Total RP: 440ch, Line2: NE-SW direction, 9km, Total SP: 32ch, Total RP:181ch.

Conclusion

The Super deep Hidaka 2000 makes clear the 3-D geometry of HMT.

The results are summarized as follows.

(1) HMT dips about 50 degrees northeastward and flattens to subhorizontal at 3km deep.

(2) Fuyushima metamorphic belt also dips about 50 degrees northeastward..