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1998-2000 年北海道トランゼクトデータの再解析による日高衝突帯の構造 IV
Lithospheric Structure of the Hidaka Collision Zone, Hokkaido, from Reanalysis of 1998-2000 Hokkaido Transect Data IV

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The Hidaka region in the central part of Hokkaido Island, Japan, is known as an arc-arc collision zone ongoing from the middle Miocene. In 2012, we started reinterpretation for a series of seismic reflection/refraction surveys from 1994 to 2000 in this collision zone. In this analysis, we used integrated and sophisticated processing and analysis techniques. including CRS/MDRS method for seismic reflection data and refraction tomography both very dense arrival time data from both the reflection and refraction/wide-angle reflection data. The most important finding so far obtained is a clear image of the NE Japan Arc subducting eastward under the northern part of the collision zone. However, the following problems are remained unsolved.

(1) Shallow structure beneath the Hidaka Collision zone is still unsolved. Particularly, the structure just east of the Hidaka Main Thrust is not sufficiently evaluated from our seismic data.
(2) Delamination of the Hidaka crust as in the southern part of this collision zone is not unclear. Our CRS/MDRS processing for the reflection data provided no positive evidence for the delamination.
(3) Deeper collision structure of the NE Japan Arc and the Kuril Arc is still not constrained. It is necessary to elucidate the subducting structure of the NE Japan Arc from amplitude data as well as travel time data.

In this paper, we focus the items (1) and (3) from seismic refraction/wide-angle reflection approach. Previous refraction tomography elucidated a thick (4-5 km) undulated sediments in the hinterland, the outcrop of crystalline crust beneath the Hidaka Metamorphic Belt with higher Vp and Vp/Vs and an enormously thick (>8-10 km) sedimentary package beneath the foreland. In order to obtain the more reliable structure model, we intensively revised the travel time data obtained both from seismic reflection/wide-angle reflection line and reflection lines. The seismic tomography using these revised data sets indicate a clearer high velocity (>6.1 km/s) anomaly just east of the HMT. We also recognized some wide-angle reflections around 5-10 km deprth beneath the HMT, from which we expect to determine the finer structure at the collision front. Our present analysis indicates the wide-angle reflection data sample a part of the lower crust of the subducting NE Japan Arc beneath the fold-and-thrust belt. According to the preliminary result, its velocity is ranging from 6.5-7.0 km/s. By combining the amplitude analysis, we expect to estimate the more reliable Moho depth of the NE Japan Arc than in the previous analyses.

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