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DISCUSSION ON THE RELATIONSHIP BETWEEN DEEP SEISMIC REFLECTION PATTERNS AND TECTONIC UNITS OF THE EASTERN PART OF THE CENTRAL ASIAN OROGENIC BELT IN NORTHEASTERN CHINA

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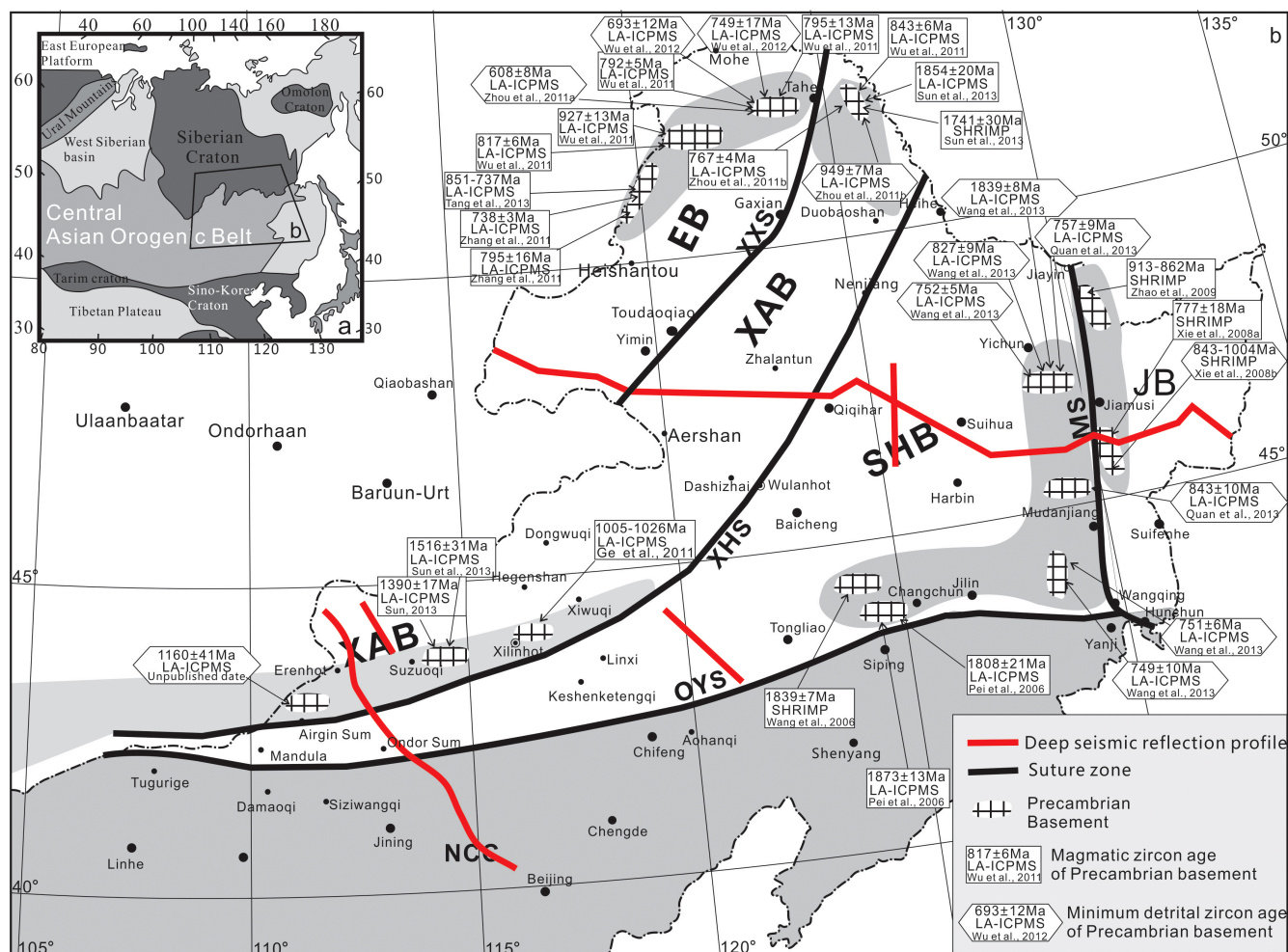
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Division of tectonic units in the eastern part of the Central Asian Orogenic Belt in northeast China has been a major concern and resulted in much fieldwork, but the division of these tectonic units in NE China is still controversial. Although detection of tectonic units in seismic sections is not straightforward, for this meeting, we shall try to relate tectonic units with the crustal and upper mantle structure and deformation derived from a ~2500 km long reflection seismic profile (Figure, red lines) in this area, recently acquired or reprocessed with support of China Geological Survey and the Chinese SinoProbe Project.

1. Reflections from a common mid-point (CMP) profile that crosses the Great Xing'An Range shows dis-

tinct dipping reflectors that appear to originate beneath the crust-mantle boundary and continue some distance into the upper mantle beneath the Great Xing'An Mountain Range. There are many arc-like reflections within the upper crust in the western Great Xing'An Mountain Range, which may reflect magmatic activity that may be associated with the formation of polymetallic ore deposits. From these reflection characteristics, it can be inferred that much of the Xing'an Block or Massif was affected by magmatic activity.

2. Deep reflections in the upper mantle lithosphere can be observed beneath the Songliao Basin and distinct dipping reflectors reflecting structures within the mantle can be seen on the eastern and western side of



Pre-Devonian blocks in XMOB, northeast China location of the CAOB (a); deep seismic reflection profiles deployed on blocks in the XMOB (modified from [Xu et al., 2015]) (b). EB = Erguna block, XAB = Xing'an-Airgin Sum block, SHB = Songliao-Hunshandake block, JB = Jiamusi block, XXS = Xinlin-Xiguitu suture, XHS = Xilinhot-Heihe suture, MS = Mudanjiang suture, OYS = Ondor Sum-Yongji suture.

the Songliao Basin deep seismic reflection profiles. The latter reflection fabrics are interpreted as structures related to subduction and collision of the Jiamusi and Songnen Massifs. Subduction- and collision-related structures beneath the the Songnen and Xing'an Massifs are identified below the the eastern western margins of the Songliao basin.

3. A north-dipping reflector is visible beneath the Moho near the northern end on a deep seismic reflection profile from northern China to the Sino-Mongolian border, and this is compatible with north-dipping reflectors in a parallel profile some 60 km to the east. These north-dipping reflectors below the Moho are different from the reflections below the Moho beneath the

Great Xing'an Range, although these profiles are located in the same tectonic unit of the Xing'an Massifs.

4. The deep structures of the same geological unit or suture zone vary greatly in different areas. For example, the crustal structures beneath the area between the XHS (Xilinhot-Heihe suture) and OYS (Ondor Sum-Yongji suture), in the southern section reveal a series of north-dipping structures in the crust that may reflect thrusting events. Another section to the north shows the lower crust dipping to the southeast, and reflections can be traced through the Moho into the upper mantle, and thus polarity of the geological unit is preserved. The reason why the structures dip in opposite direction needs further discussions.

REFERENCES

Xu B., Zhao P., Wang Y., Liao W., Luo Z., Bao Q., Zhou Y., 2015. The pre-Devonian tectonic framework of Xing'an-Mongolia orogenic belt (XMOB) in north China. *Journal of Asian Earth Sciences* 97 (Part B), 183–196. <https://doi.org/10.1016/j.jseas.2014.07.020>.