

China's first intermediate resolution multi-channel seismic survey in the northern Victoria Land Basin and Terror Rift, Ross Sea, Antarctica

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The West Antarctic Rift System (WARS) represents one of the largest active continental rift systems on Earth and is less well known than other rift systems because it is largely covered by thick ice. The Terror Rift (TR), superimposing on the Victoria Land Basin (VLB) in the western Ross Sea, is identified as the most recent deformational zone of the WARS, thus will provide knowledge of the active deformation process of the WARS. The structure and kinematics of the TR is under debate. Originally, the TR was thought to consist of two parts: the Discovery Graben and the magmatically-intruded Lee Arch. New denser seismic grid in the middle and southern segments of the TR revealed a different structure of the Lee Arch while the northern segment of the TR is not well studied.

The glacial history of the VLB/TR region is another attractive issue to the geologists since this area records the behavior information of EAIS and WAIS. In the southern part of the VLB, especially in the McMurdo Sound, the framework of the glacial history is well established after several deep cores which recovery the whole stratigraphic sequences since the onset of the glaciation. However, the glacial history of the northern part of the VLB/TR is less well studied and here we emphasize its importance because the northern part of the VLB/TR is a link between the well-studied southern VLB and the sediment-well-preserved Northern Basin.

During the 32nd Chinese National Antarctic Research Expedition, on the board of the RV XueLong, we collected intermediate resolution multi-channel seismic reflection data in the northern VLB/TR. These data will establish new constraints on the timing of deformation, structure and kinematics of the TR, and the history of the EAIS and WAIS.