

Larry D. BROWN, ZHAO Wenjin, GAO Rui, CHEN Chen, LU Zhanwu, WU Zhenhan, INDEPTH and SINOPROBE Teams, 2013. A Deep Seismic Reflection Profile Spanning the Tibetan Plateau: INDEPTH and SINOPROBE. *Acta Geologica Sinica* (English Edition), 87 (supp.): 39.

A Deep Seismic Reflection Profile Spanning the Tibetan Plateau: INDEPTH and SINOPROBE

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Beginning in 1992, Project INDEPTH was formed as an international collaboration led by the Chinese Academy of Geological Sciences with the ambitious goal of collecting a lithospheric scale, multichannel seismic reflection profile across the Himalayas and Tibet Plateau. During the course of its subsequent field programs in 1994, 1996 and 2007 the INDEPTH Consortium expanded to include a diverse array of geophysical and geological surveys to probe the nature and evolution of the Plateau. In 2009-2010 the SINOPROBE initiative, inspired in part by the success of INDEPTH, collected its own deep seismic reflection profiles within and along the boundaries of the Tibet Plateau. Here we present the results of integrating the INDEPTH seismic reflection profiling with complementary results from the SINOPROBE II survey in central Tibet, providing a comprehensive view of the

Tibetan lithosphere as represented by high resolution reflection profiling. Interpretation of this new representation is guided by critical complementary observations from passive seismology, magnetelluric surveys and geologic mapping along this trans-Tibetan corridor. Highlights of this new image include the “thin-skinned” nature of crustal overthrusting in the Himalayas, the distribution of proposed partial melts zones in the Tibetan crust, the internal morphology of the Tibetan Moho, constraints on possible crustal flow within the Tibetan crust and the Moho step at the northeastern edge of the plateau which contrasts dramatically with the geometry of collision along the Himalayan margin.

Key words: Tibet, lithospheric structure, deep seismic profiling

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