



The Lithospheric Structure of the Solonker Suture Zone and Adjacent Areas: Crustal Structure Revealed by a High-Resolution Magnetotelluric Study

Gaofeng Ye, Sheng Jin, Wenbo Wei, and Jian'en Jing
China University of Geosciences, Beijing

The closure of the Paleo-Asian Ocean along the Solonker Suture Zone (SSZ) during the Late Permian and Triassic represented the final stage in the formation of the Central Asian Orogenic Belt between the Siberian Craton and the North China Craton. In order to better understand the structure and formation of this ancient subduction zone, a high-resolution magnetotelluric (MT) profile was collected with both broadband and long-period MT data. The high resolution mapping of the lithosphere achieved in this study is due to the closely spaced MT stations (2-3 km). With the 2-D resistivity model, a south-dipping conductor was detected and extends through the entire crust. The geometry of this feature provides evidence that a southward directed subduction zone formed the Solonker suture. The enhanced conductivity was interpreted to subducted sulfide-bearing graphitic sediments. The resistive body beneath the northern margin of the North China Craton indicates a thickened lithosphere caused by the southward subduction at this region, and the resistive body beneath the Solonker Suture Zone indicates the subducted oceanic lithosphere. North-dipping low resistivity features were also detected in the crust of both the North China Craton and Central Asian Orogenic Belt, and were interpreted as post-collisional thrust faults. Strong anisotropy was found beneath the suture zone, and can be explained if the high strain rate has rotated the fold axes into the dip direction.