



## **Lithospheric structure of the Iranian Plateau using converted waves**

Elham Mohammadi (1), Forough Sodoudi (2,3), and Mehdi Rezapour (1)

(1) Institute of Geophysics, University of Tehran, 14155-6466, Tehran, Iran, (2) Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany, (3) Freie Universität Berlin, Malteserstr. 74-100, 12249 Berlin, Germany

The continental collision between the Arabian and Eurasian plates resulted in a tectonically young and complex deformation in the Iranian plateau. The present-day Iranian plateau is characterized by diverse tectonic domains including the continental collisions (e.g. Zagros and Alborz) and the oceanic plate subduction (e.g. Makran). We combined a large number of P and S receiver functions obtained from teleseismic events recorded at 93 national permanent stations (23 broadband and 70 short period stations) to provide a detailed image of the crust–mantle and lithosphere–asthenosphere boundaries (LAB) of the Iranian plateau. Our P receiver function results allowed for more precise calculation of the Moho depth and enabled us to provide a high-resolution Moho depth map for the whole Iranian Plateau for the first time. Furthermore, S receiver functions obtained from broadband stations clearly imaged the base of the lithosphere and its variations within the different tectonic zones of the Iranian Plateau. Our results showed significant variations of crustal thickness due to different geological features existed within the Iranian Plateau. A relatively shallow LAB at about 80-90 km depth was observed beneath the whole plateau with some exceptions. We detected the most complex structure beneath the Zagros Fold and Thrust Belt (ZFTB) where the Arabian plate is believed to underthrust beneath Central Iran. According to our results, the thickest crust of approximately 70 km was seen under the Sanandaj-Sirjan zone (SSZ) indicating the overthrusting of the crust of Central Iran onto the Zagros crust along the Main Zagros Thrust (MZT). The location of the boundary between these two plates was estimated to be beneath the SSZ, which is slightly shifted northeastward relative to the surficial expression of the MZT. Furthermore, the Arabian plate (ZFTB) is characterized by the relatively thick lithosphere of about 130 km reaching 150 km beneath the SSZ, whereas other tectonic zones are recognized by a thin lithosphere of about 90 km.