**Supplementary Material**

**Mantle-flow diversion beneath the Iranian plateau induced by Zagros’ lithospheric keel**

Ayoub Kaviani1, Meysam Mahmoodabadi1,2, Georg Rümpker1, Simone Pilia3, Mohammad Tatar2, Faramarz Nilfouroushan4,5, Farzam Yamini-Fard2, Ali Moradi6, and Mohammed Y. Ali7

1 Institute of Geosciences, Goethe University, Frankfurt, Germany

2 International Institute of Earthquake Engineering and Seismology, Tehran, Iran

3 Department of Earth Sciences-Bullard Labs, University of Cambridge, Cambridge, UK

4 Faculty of Engineering and Sustainable Development (ATM), University of Gävle, Sweden

5 Department of Geodetic Infrastructure, Lantmäteriet, Gävle, Sweden

6 Institute of Geophysics, University of Tehran, Tehran, Iran

7 Department of Earth Sciences, Khalifa University of Science and Technology, Abu Dhabi, UAE

The supplementary material includes two figures S1 & S2 and two tables Table 1 & Table 2.

*Figure S1: Individual SKS splitting measurements plotted at piercing point locations corresponding to depths a) 100km and b) 200km. The background shear-wave tomography maps are after Priestley and McKenzie (2013). The thick black line approximately delineates the surface trace of the boundary between the Arabian and Eurasian plates.*

*Figure S2: Split delay times vs. lithospheric thickness*

*Table 1: The list of parameters of the one-layer model as obtained by joint-inversion for each station*

*Table 2: The list of individual splitting parameters obtained by processing of each single XKS phase at each station*