Supplement of Solid Earth, 6, 207–216, 2015
http://www.solid-earth.net/6/207/2015/
doi:10.5194/se-6-207-2015-supplement

Solid Earth Open Access

Supplement of

Variations of the crustal thickness in Nepal Himalayas based on tomographic inversion of regional earthquake data

I. Koulakov et al.

Correspondence to: I. Koulakov (koulakoviy@ipgg.sbras.ru)

Introduction

In addition to the vertical sections of the P-velocity anomalies presented in the main paper (Figure 3), here we show four horizontal sections of P- and S-velocity anomalies (Figure S1).

To estimate horizontal resolution of the obtained model within the Nepal borders we performed a synthetic test with free shaped anomalies which is presented in Figure S2. We defined several positive and negative free-shaped anomalies in the crust down to a depth of 50 km. Amplitude of the anomalies are +/- 10%. Position and shape of the anomalies are show in with the contour lines. Results of the reconstruction for P and S model presented in horizontal slices in four depth levels. Results of this test show that only position of the anomalies could properly reconstructed, whereas its shape smeared in horizontal direction. Vertical smearing is not significant.

Procedure of the identification of the Moho depth based on the tomography results is illustrated in Figure S3. We have manually traced the lower limit of the crustal-related low-velocity anomaly in 21 vertical sections passing across the Himalayan chain. Positions of the vertical sections are shown in Figure S4. For some sections (sections 5 to 7) unambiguous definition of lower limit of the low-velocity anomaly is not possible. An alternative variant of the lower limit of the low-velocity anomaly shown in Figure S3 with dashed lines. The result of interpolation for the main Moho depth model corresponding to the solid lines is presented in the main paper in Figure 4a. In Figure S4, we present an alternative model of the Moho depth based on solutions with dotted lines, which seems to be less plausible than presented in the main paper.

The magnetic field for the large region of India and Tibet is presented in Figure S5. It could be seen that Indian plate is strongly inhomogeneous. The possible reason is discussed in main paper. Note, that Tibet and South China plate presented in map by very homogeneous structure of the magnetic field, which reflect the lack of the data and not the real structure.

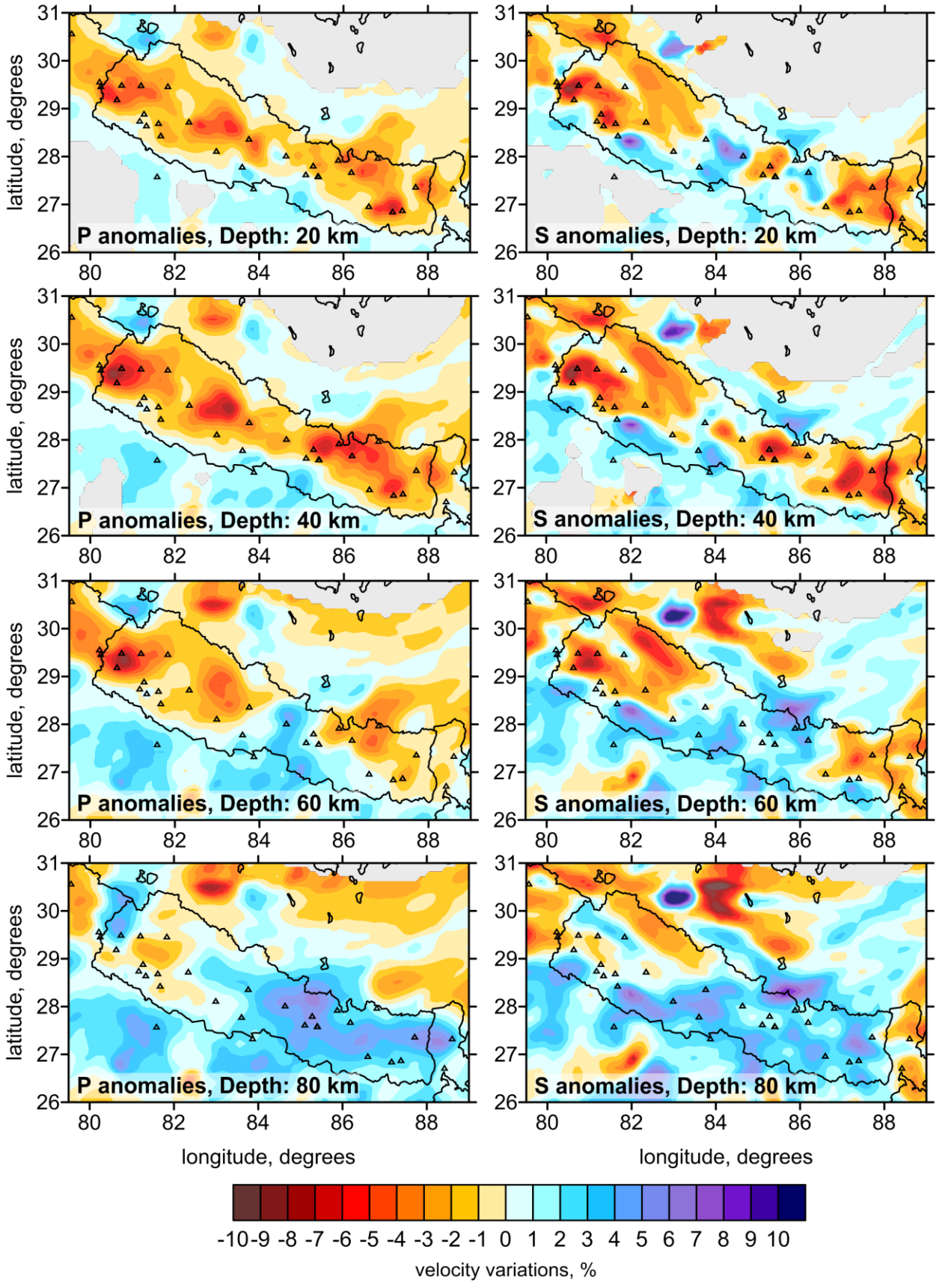

Figure S1. Results of the real data tomographic inversion in horizontal slices.

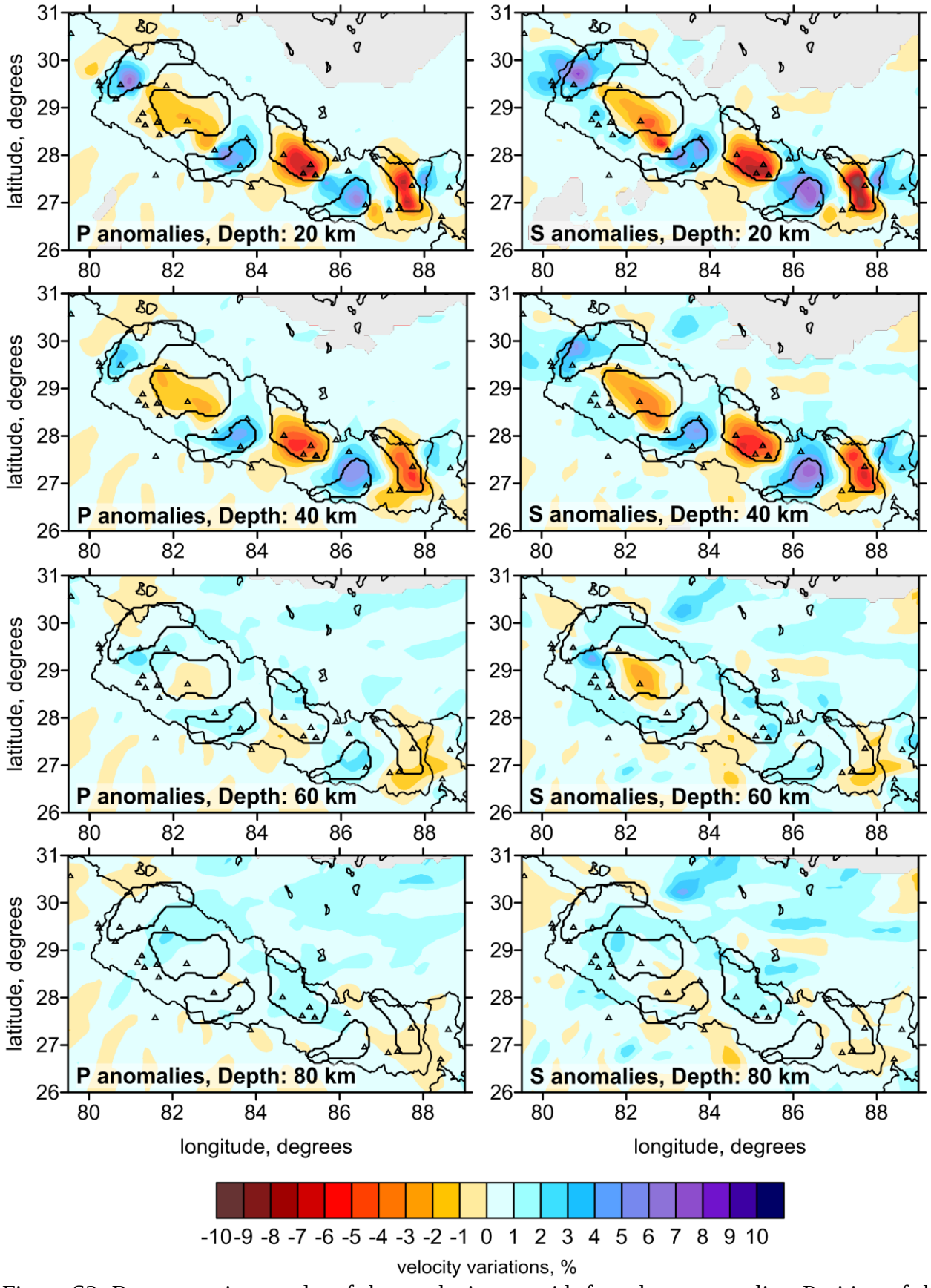

Figure S2. Reconstruction results of the synthetic test with free shape anomalies. Position of the initial anomalies defined in a depth range -10 to 50 km is shown with counters. Initial amplitude of the anomalies is +/- 10%.

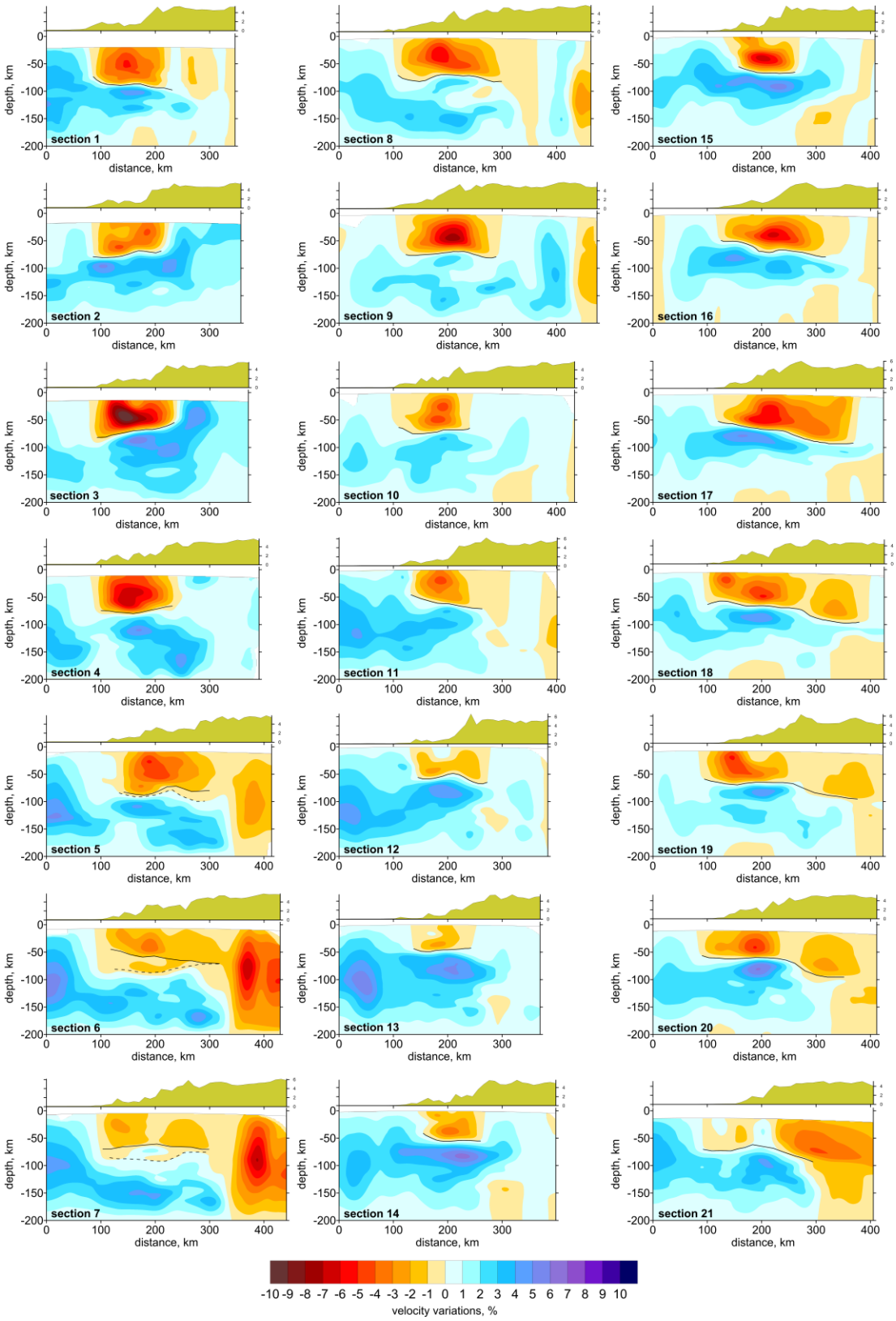

Figure S3. Results of the real data tomographic inversion in vertical sections. Position of the sections is shown in Figure S4. The black line in sections indicate the traced lower limit of the low-velocity anomaly. The dashed black line in sections 5 to 7 reflects alternative variant of the trace.

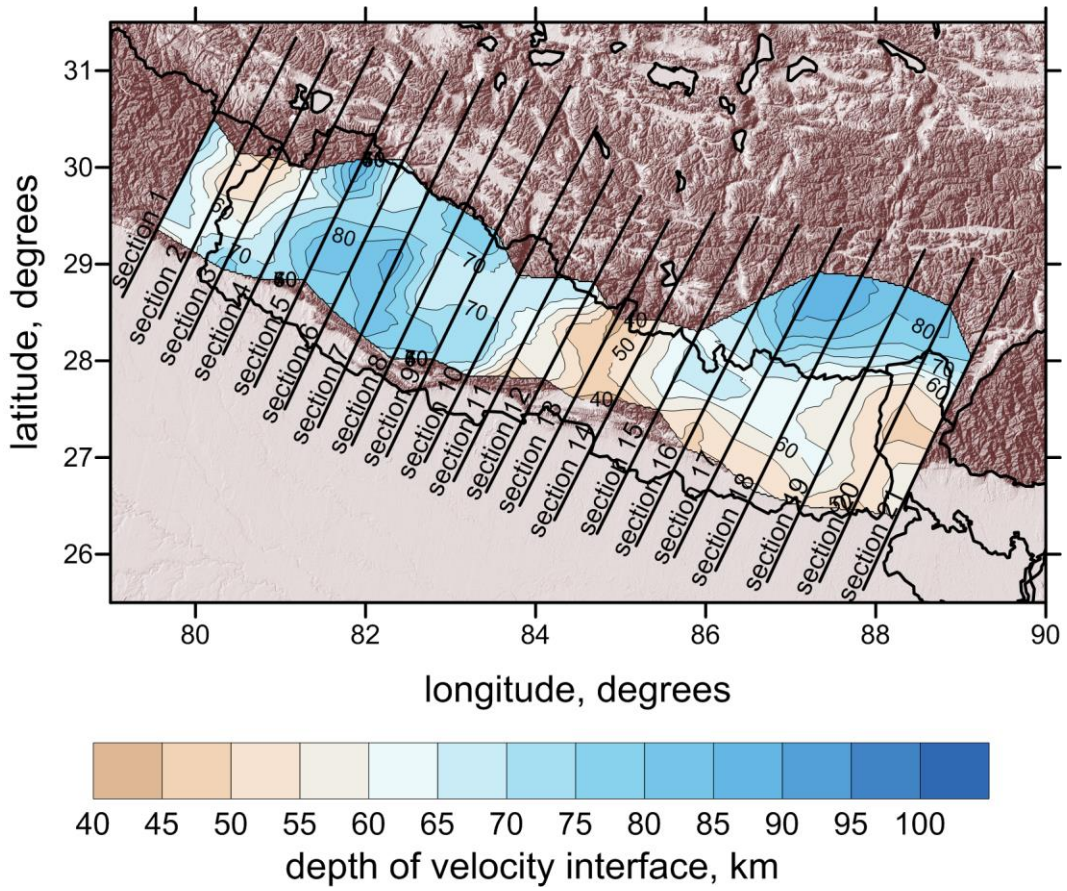

Figure S4. Alternative variant of crustal thickness estimated from tomography. The black lines indicate position of the vertical sections presented in Figure S3.

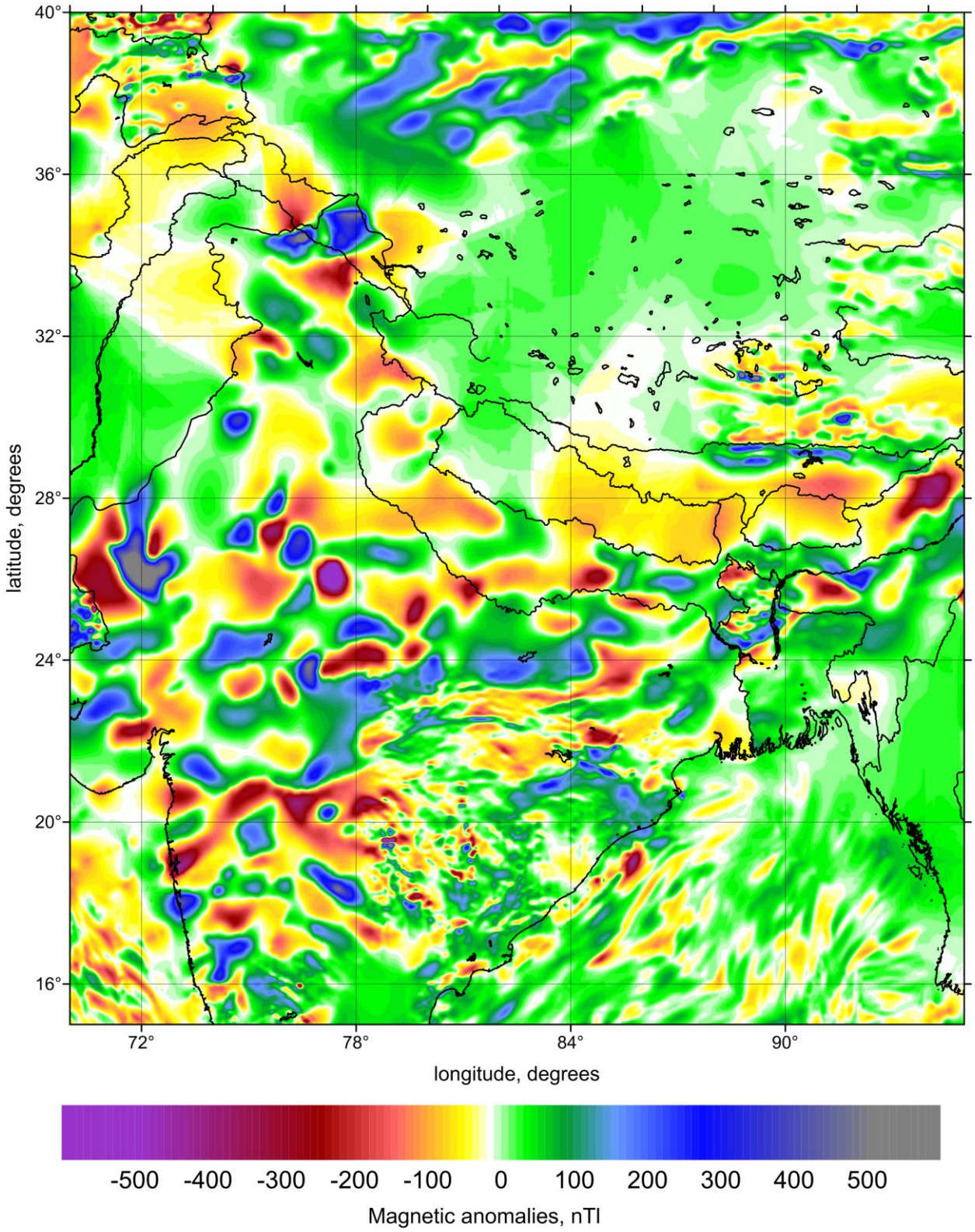

Figure S5. Regional map of magnetic anomalies.