

- Supplement 1: Examples of cross-correlation functions (a) between data from station CZ.PRU and all permanent stations in summer (left) and winter (right) months. The band-pass filter 5 – 7 s was applied before the analysis. The blue lines delimit windows used to measure RMS amplitude of coherent signal and the red lines delimit windows used to measure RMS amplitude of non-coherent noise. Azimuth-interstation distance rose diagrams present signal-to-noise ratio (b) and source directivity calculated as ratios of the causal and acausal parts of the CCF signals (c) for all permanent stations in the region for winter and summer months (left and right diagrams, respectively). The CCFs and measurements in the rose diagrams, which do not satisfy the minimal separation condition of the station-pair at each period band, are grey and shaded, respectively.
- Supplement 2: Examples of cross-correlation functions (a) between data from station CZ.PRU and all permanent stations in summer (left) and winter (right) months. The band-pass filter 17 – 21 s was applied before the analysis. The blue lines delimit windows used to measure RMS amplitude of coherent signal and the red lines delimit windows used to measure RMS amplitude of non-coherent noise. Azimuth-interstation distance rose diagrams present signal-to-noise ratio (b) and source directivity calculated as ratios of the causal and acausal parts of the CCF signals (c) for all permanent stations in the region for winter and summer months (left and right diagrams, respectively). The CCFs and measurements in the rose diagrams, which do not satisfy the minimal separation condition of the station-pair at each period band, are grey and shaded, respectively.
- Supplement 3: Examples of cross-correlation functions (a) between data from station CZ.PRU and all permanent stations in summer (left) and winter (right) months. The band-pass filter 34 – 40 s was applied before the analysis. The blue lines delimit windows used to measure RMS amplitude of coherent signal and the red lines delimit windows used to measure RMS amplitude of non-coherent noise. Azimuth-interstation distance rose diagrams present signal-to-noise ratio (b) and source directivity calculated as ratios of the causal and acausal parts of the CCF signals (c) for all permanent stations in the region for winter and summer months (left and right diagrams, respectively). The CCFs and measurements in the rose diagrams, which do not satisfy the minimal separation condition of the station-pair at each period band, are grey and shaded, respectively.
- Supplement 4: Examples of cross-correlation functions (a) between data from station CZ.PRU and all permanent stations in summer (left) and winter (right) months. The band-pass filter 43 – 53 s was applied before the analysis. The blue lines delimit windows used to measure RMS amplitude of coherent signal and the red lines delimit windows used to measure RMS amplitude of non-coherent noise. Azimuth-interstation distance rose diagrams present signal-to-noise ratio (b) and source directivity calculated as ratios of the causal and acausal parts of the CCF signals (c) for all permanent stations in the region for winter and summer months (left and right diagrams, respectively). The CCFs and measurements in the rose diagrams, which do not satisfy the minimal separation condition of the station-pair at each period band, are grey and shaded, respectively.
- Supplement 5: Examples of cross-correlation functions (a) between data from station CZ.PRU and all permanent stations in summer (left) and winter (right) months. The band-pass filter 5 – 50 s was applied before the analysis. The blue lines delimit windows used to measure RMS amplitude of coherent signal and the red lines delimit windows used to measure RMS amplitude of non-coherent noise. Azimuth-interstation distance rose diagrams present signal-to-noise ratio (b) and source directivity calculated as ratios of the causal and acausal parts of the CCF signals (c) for all permanent stations in the region for winter and summer months (left and right diagrams, respectively). The CCFs and measurements in the rose diagrams, which do not satisfy the minimal separation condition of the station-pair at each period band, are grey and shaded, respectively.
- Supplement 6: Example of a dispersion curve for the pair of stations Z3.A001A–Z3.A354A from frequency-time analysis (FTAN) (a) and Rayleigh wave group velocities at 19 s period between all station pairs (b). The blue curve in part (a) is the dispersion curve picked with sampling indicated by blue diamonds. The solid black line in (a) marks the long-period cut-off, which is the function of the interstation distance.
- Supplement 7: Final group velocity model at period 6 s along with its roughness measures computed as RMS of the 2nd derivative of velocities (i.e., mean curvature).
- Supplement 8: Final group velocity model at period 12 s along with its roughness measures computed as RMS of the 2nd derivative of velocities (i.e., mean curvature).
- Supplement 9: Final group velocity model at period 19 s along with its roughness measures computed as RMS of the 2nd derivative of velocities (i.e., mean curvature).
- Supplement 10: Final group velocity model at period 37 s along with its roughness measures computed as RMS of the 2nd derivative of velocities (i.e., mean curvature).

- Supplement 11: Final group velocity model at period 48 s along with its roughness measures computed as RMS of the 2nd derivative of velocities (i.e., mean curvature).
- 50 Supplement 12: Shear velocity slices through the final model at 10, 25 and 32 km depths.
- Supplement 13: Maps of standard deviations and skewness coefficients for 10 % of the best-fitting models computed for the Moho depths. The skewness measure is computed as the Fisher-Pearson coefficient of skewness (Kokoska and Zwillinger, 2000).
- Supplement 14: Average velocities in the upper and the lower parts of the crust (UPC and LPC, respectively). The average velocities of each layer are defined in the model space of the stochastic inversion (see Table 1).
- 55 Supplement 15: Examples of dispersion curves for v_S models shown in Fig. 7. Blue curve is the corresponding dispersion curve of the average model calculated from the 10 % of the best fitting models from the 400 000 models in total (yellow-to-green curves). Dispersion curve input into the inversion is in grey dots.
- Supplement 16: Maps of standard deviations and skewness coefficients for 10 % of the best-fitting models computed for depths of the UPC/LPC interface. The skewness measure is computed as the Fisher-Pearson coefficient of skewness (Kokoska and Zwillinger, 2000).
- 60 Supplement 17: 3-D view of the v_S ANT model of the BM from the west. For more details, see Fig. 9.
- Supplement 18: 3-D view of the v_S ANT model of the BM from the north-east. For more details, see Fig. 9.
- Supplement 19: 3-D view of the v_S ANT model of the BM from the north. For more details, see Fig. 9.
- Supplement 20: 3-D view of the v_S ANT model of the BM from the east. For more details, see Fig. 9.
- 65 Supplement 21: Moho depth in the BM derived from receiver functions at individual stations. The Moho depth of 38 km is contoured. IASP'91 average crust velocity and $v_P/v_S = 1.729$ is used in the Ps–P delay-time conversion to Moho depth.
- Supplement 22: Depth differences between the $Moho_{RF}$ and $Moho_{ANT}$ (a) and their frequency distribution (b).
- Supplement 23: Depth differences between the $Moho_{RF(v_{ANT})}$ and $Moho_{ANT}$ (a) and their frequency distribution (b).
- 70 Supplement 24: Estimates of v_P/v_S to match Moho depth from $Moho_{RF(v_{ANT})}$ and $Moho_{ANT}$ (a) and their frequency distribution (b). Unrealistic values of v_P/v_S lower than 1.5 are shaded.
- Supplement 25: Histogram of the ray path coverage in dependence on period (a). Average sensitivity kernels (b) calculated for velocity profile at all cells in the BM. Black line in green box marks depth of maximum sensitivity and size of the box marks zone of more than 50 % of maximum sensitivity in each period. Orange curve shows the RMS of travel time residuals after the fast marching inversion (FMST) for all station pairs.
- 75 Supplement 26: Tests of gradational vs. sharp Moho at two crossing points of the CSS profiles S04 x CEL10 (a) and CEL09 x CEL10 (b). Thickness of the potential transitional layer does not exceed 2 km in the ANT model.