

The expression of mantle seismic anisotropy in the global seismic wavefield – Supplementary Material

Jonathan Wolf^{1,*}, Maureen D. Long¹, Daniel A. Frost³, Tarje Nissen-Meyer²

Supplementary Figures

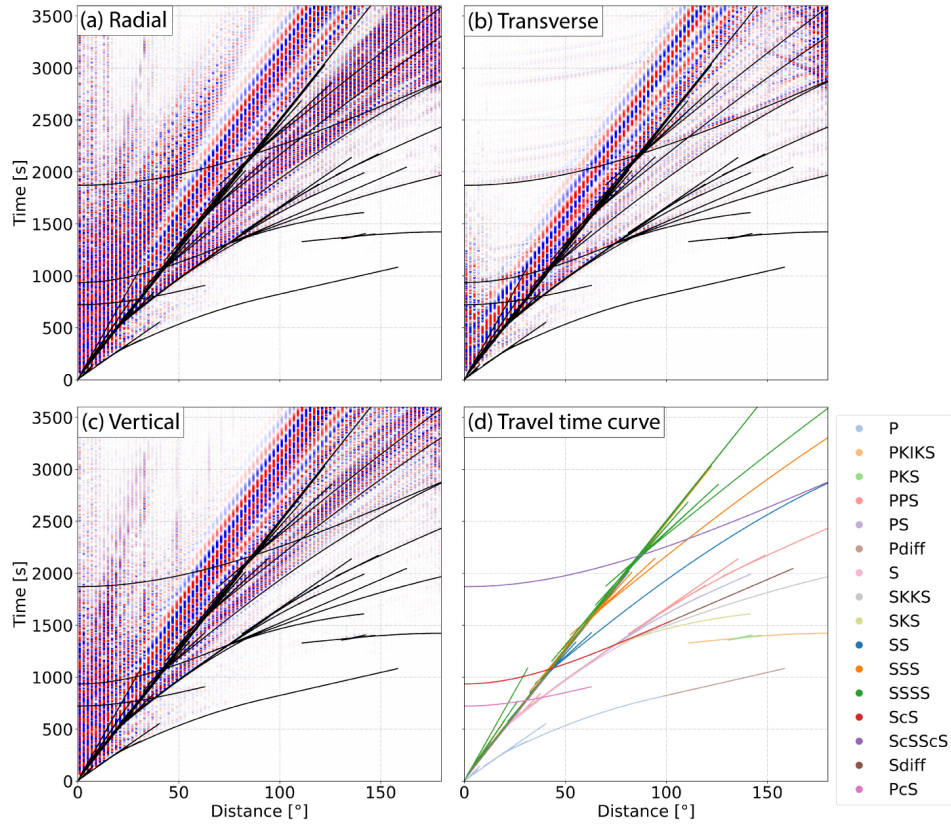


Figure S1: Differential displacement wavefield as a function of distance for an azimuth of 0° , calculated using a strike-slip source and elastic tensor arrangement 1 (Figure 2) for seismic anisotropy in layer 2 (lower upper mantle). (a) Radial component difference; (b) transverse component difference; (c) vertical component difference; (d) travel time curve from Figure 1c.

*Corresponding author

Email address: jonathan.wolf@yale.edu (Jonathan Wolf)

¹Department of Earth and Planetary Sciences, Yale University, New Haven, CT, USA

²Department of Earth Sciences, University of Oxford, Oxford, UK

³School of the Earth, Ocean and Environment, University of South Carolina, Columbia, SC, USA

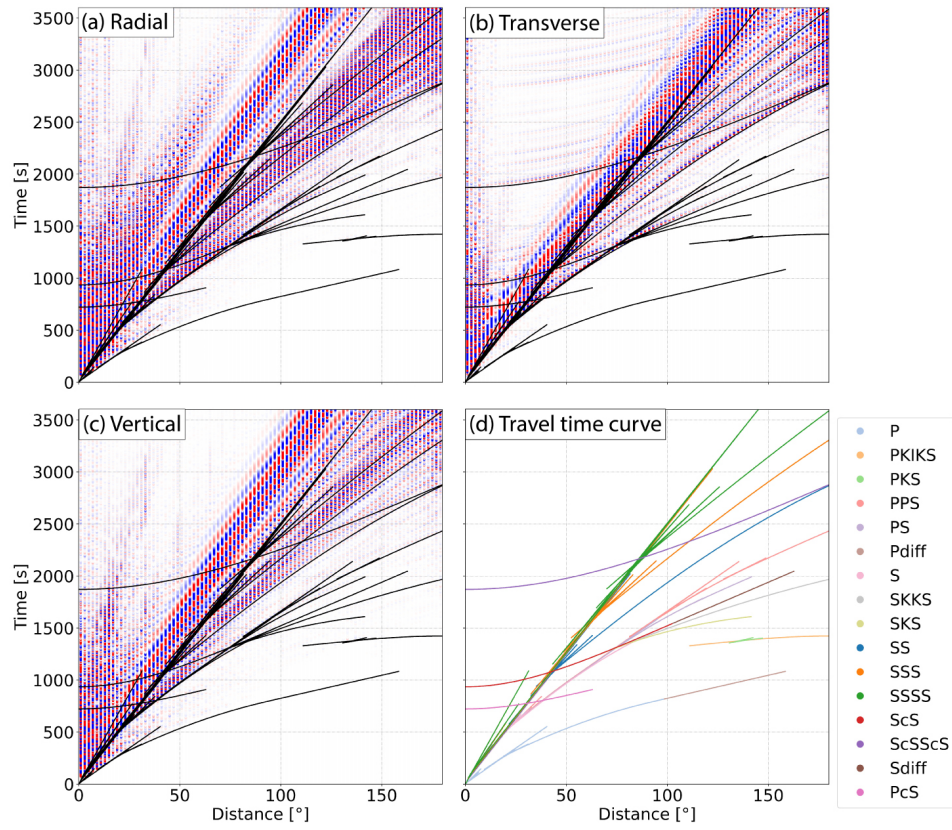


Figure S2: Same as Figure S1 for an azimuth of 30° .

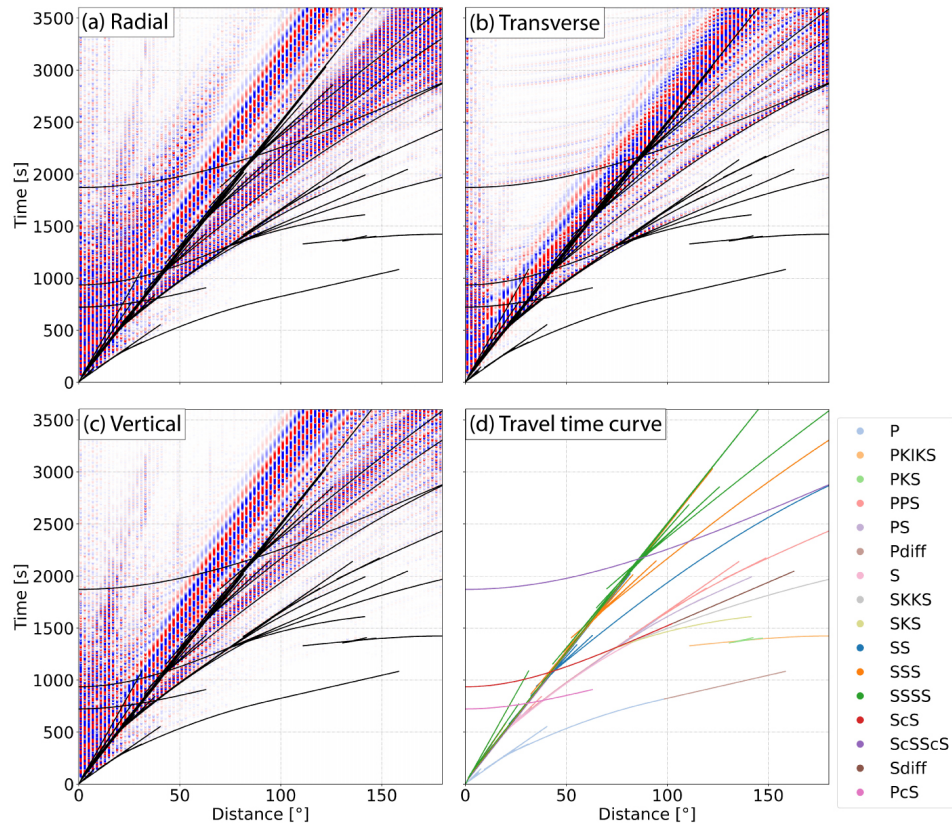


Figure S3: Same as Figure S1 for an azimuth of 60° .

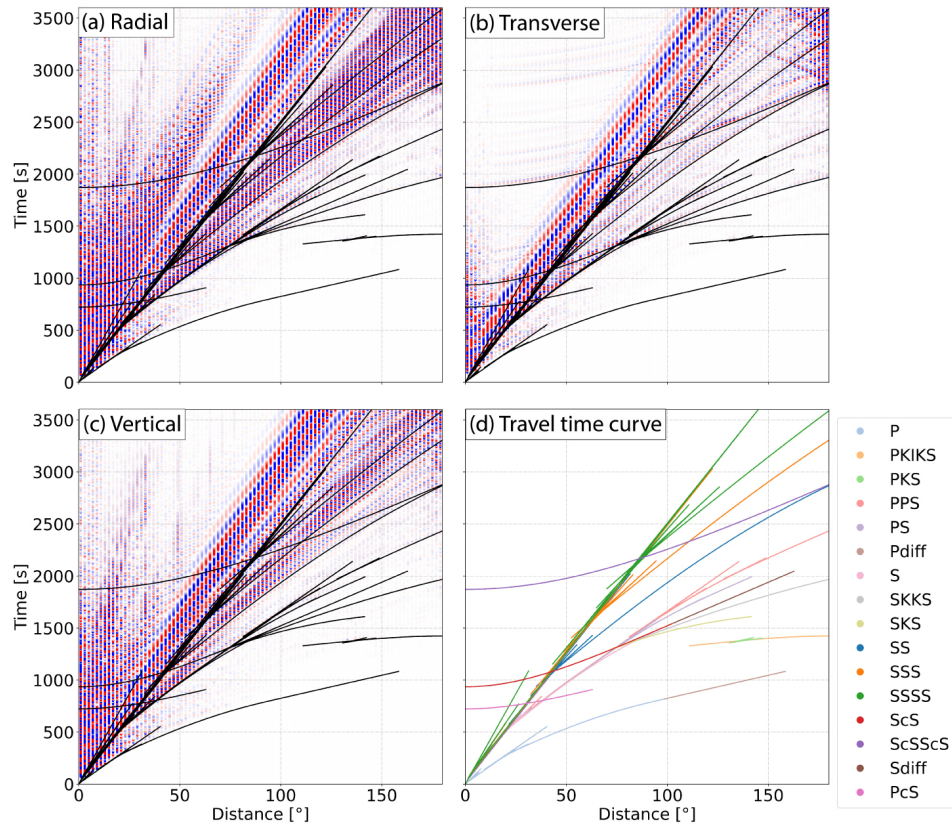


Figure S4: Same as Figure S1 for an azimuth of 90° .

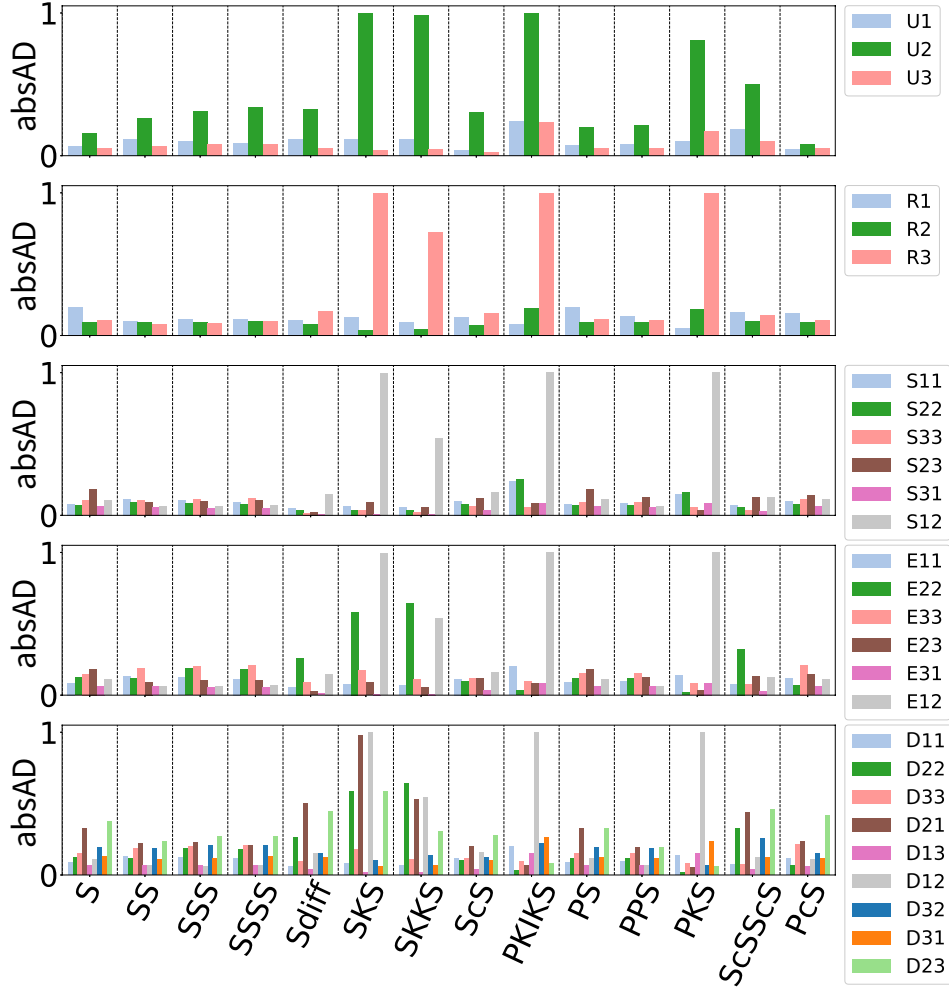


Figure S5: $absAD_{U_i}$ (see text) for U_i , D_i , S_{ij} , E_{ij} and G_{ij} for seismic anisotropy in layer 2 (lower upper mantle), where $i,j = 1,2,3$ correspond to the radial (1), transverse (2) and vertical (3) direction. Values are normalized to the largest component. For legend see colors to the right. This figure was created for a strike-slip focal mechanism and elastic tensor arrangement 1.

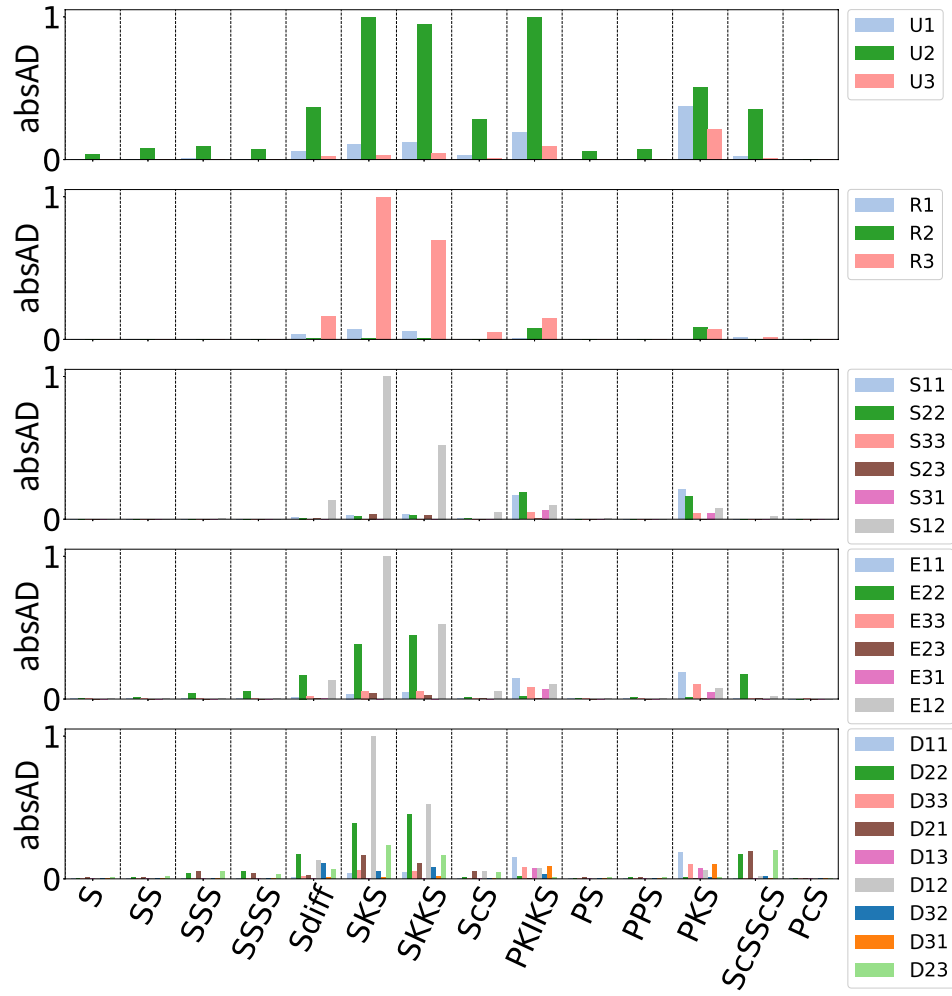


Figure S6: Same as Figure S5, but for lowermost mantle anisotropy.

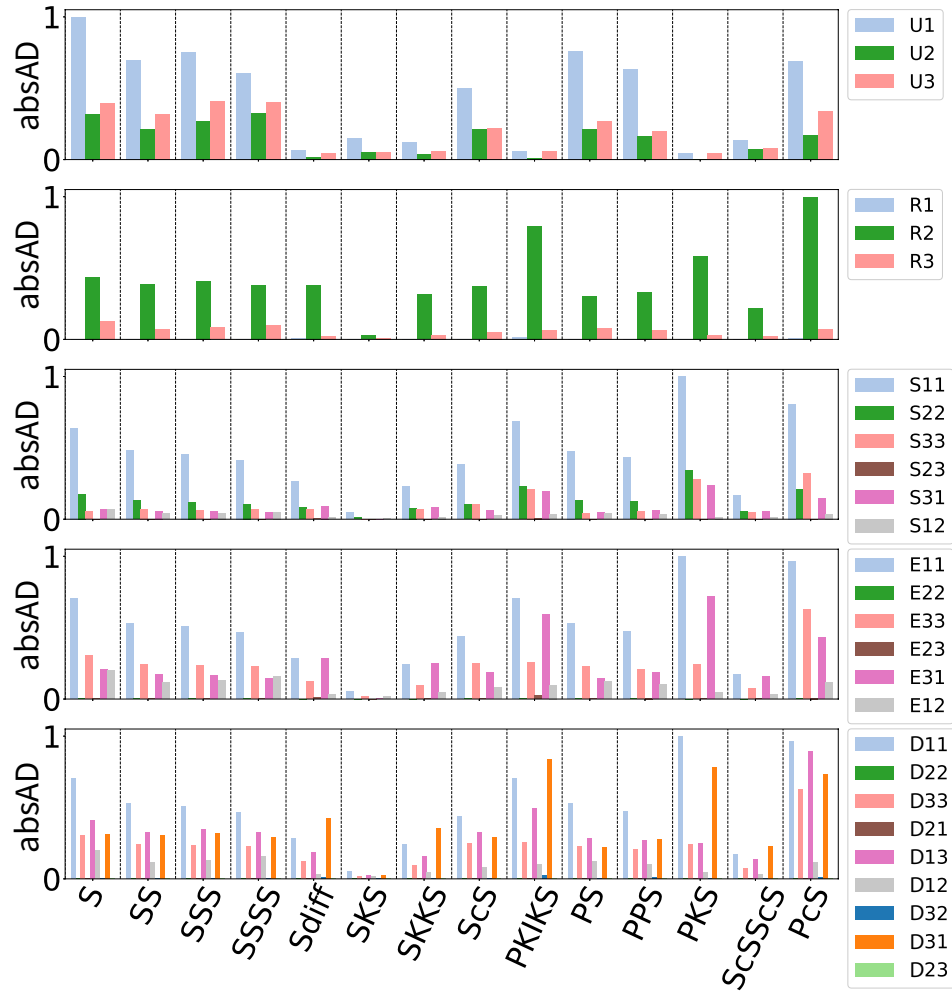


Figure S7: Same as Figure S5, but for a normal fault focal mechanism.

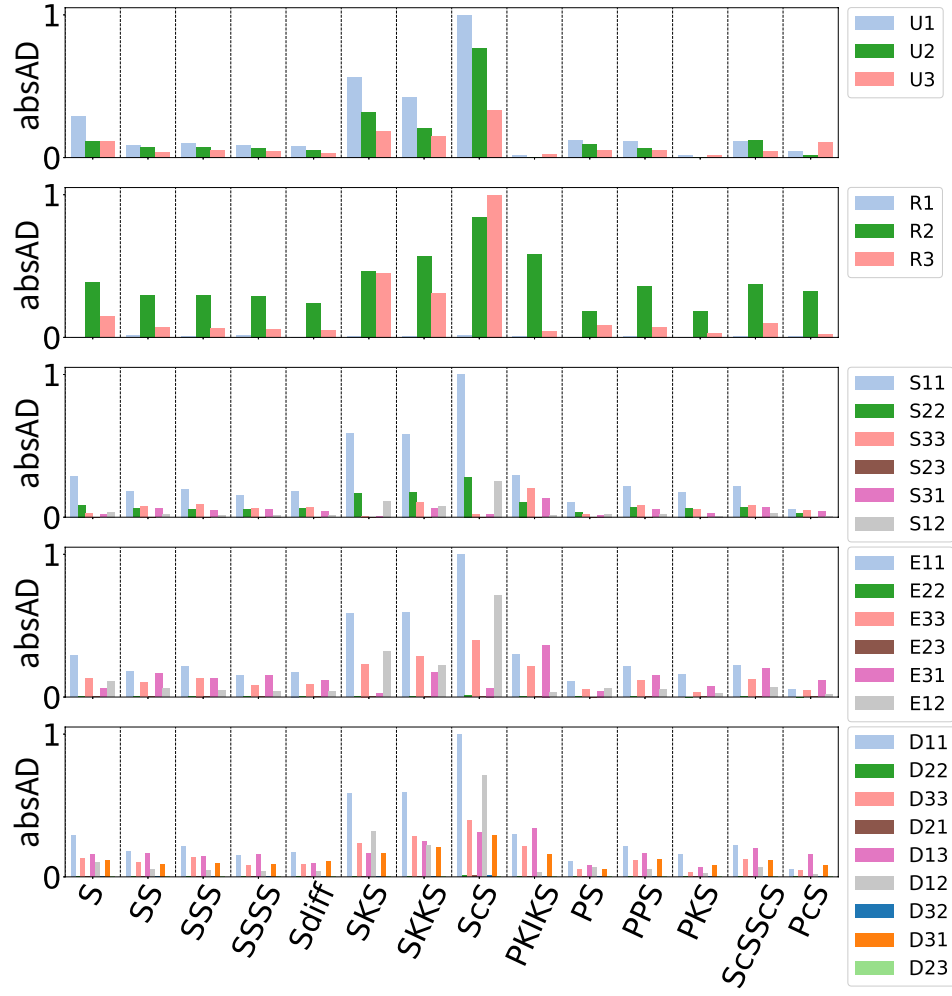


Figure S8: Same as Figure S5, but for lowermost mantle anisotropy and a normal fault focal mechanism.

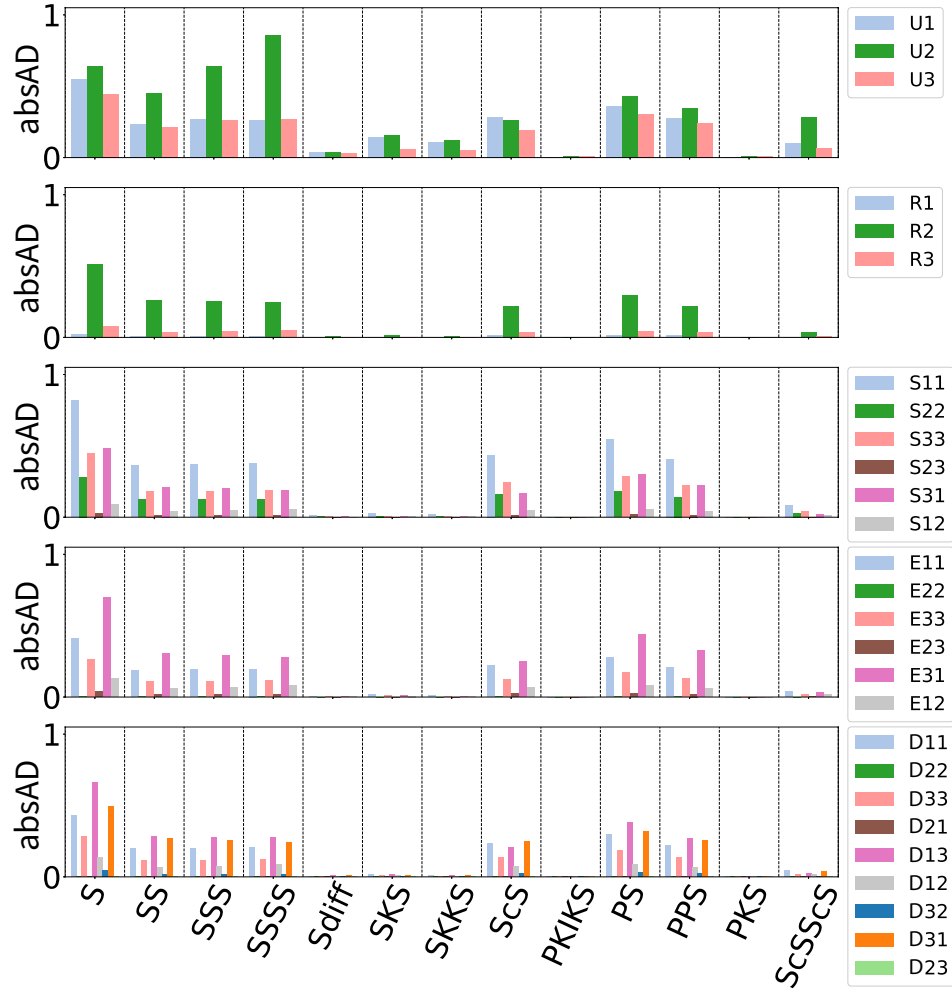


Figure S9: Same as Figure S5, but for elastic tensor arrangement 2.

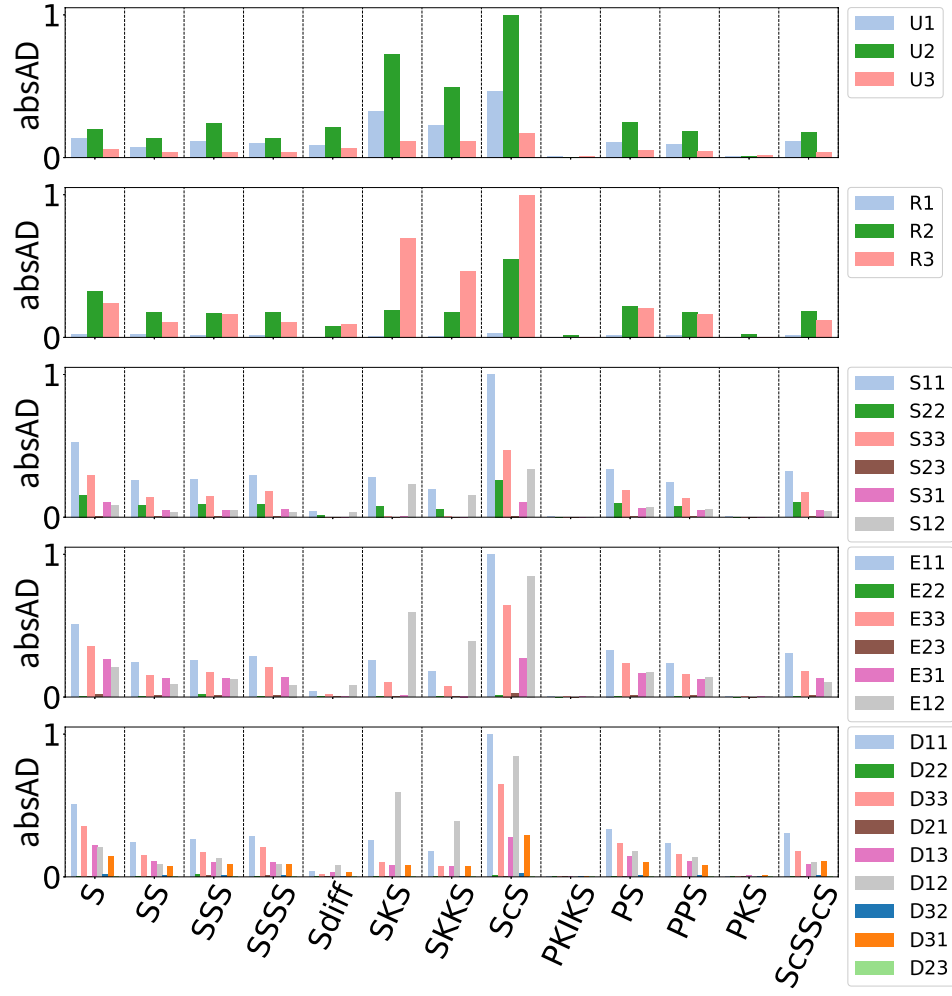


Figure S10: Same as Figure S5, but for lowermost mantle anisotropy and elastic tensor arrangement 2.

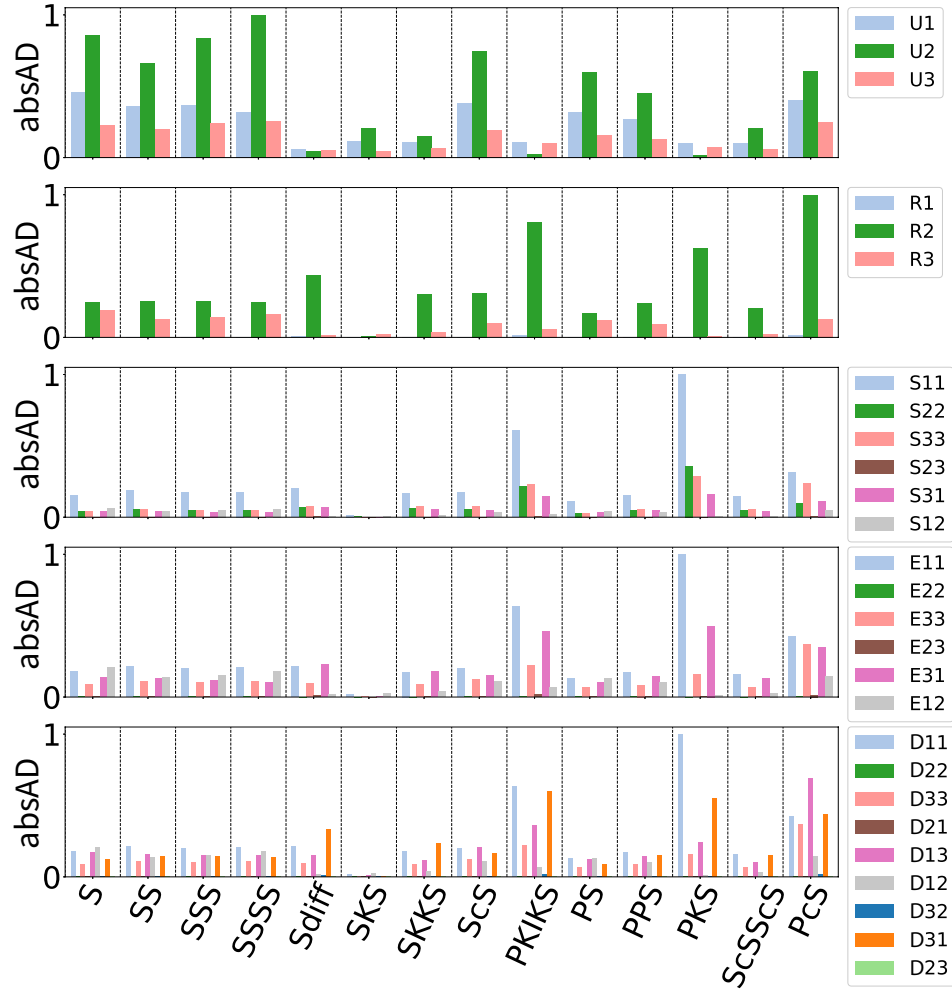


Figure S11: Same as Figure S5, but for elastic tensor arrangement 2 and a normal fault focal mechanism.

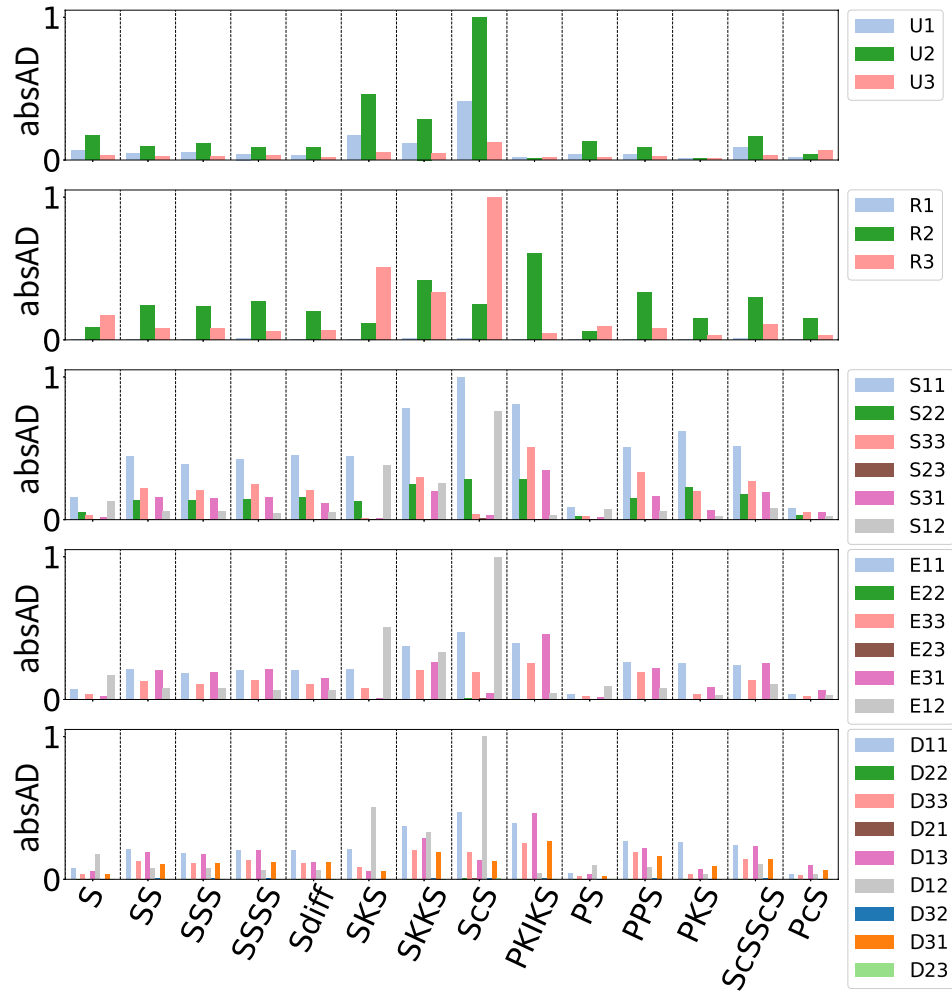


Figure S12: Same as Figure S5, but for lowermost mantle anisotropy, elastic tensor arrangement 2 and a normal fault focal mechanism.

Explanation for Supplementary Movies S1-S5

Left panels: Differential wavefield, normalized to the largest value (see scale bar) for vertical (top), transverse (middle) and radial (bottom) components.

Right panels: Radial component (black) seismograms and differential seismograms (times 10) for radial (red) and transverse (blue) components in a 300 s time window around the PREM arrival time at epicentral distances 10° , 40° , 70° , 100° , 130° , 160° .