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Uppermost mantle Pn velocity and anisotropy Structures beneath Mongolia and its adjacent regions by travel time inversion

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In this work, we present $2^\circ \times 2^\circ$ high-resolution Pn velocity and anisotropy tomographic models of the uppermost mantle beneath Mongolia and its adjacent regions by inverting travel times of Pn arrivals. The average Pn velocity of the mantle lid is 8.17 km/s, substantially faster than the global average. We also measured azimuthal anisotropy in the upper and lower mantle lid by grouping the travel time data into two different epicentral distance ranges. A distinct contrast in the velocity of the uppermost mantle is observed between the central part and two ends of the Baikal Rift zone, with the presence of relatively higher velocities under the Central Baikal Rift, and anomalously low velocity and horizontal flow radially away from Hangay Dome. The obvious depth dependence of Pn anisotropy models within the upper mantle beneath the Hentey Mountains suggests different origins for different fabrics. The deeper anisotropy is mostly likely attributed from asthenospheric flow while the shallower fabric may result from preserved lattice preferred orientation (LPO) anisotropy in the uppermost mantle. Depth-dependent anisotropic structures and significantly low velocity are found beneath the Tien Shan orogenic belt, suggesting the lithospheric mantle has undergone thinning processes by delamination or a local scale asthenospheric upwelling.