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Lower crust and Moho forming processes imaged in the ESRU profile, Middle Urals

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The ESRU reflection seismic data from the Middle Urals images a zone of strong, subhorizontal lower crustal reflectivity and Moho transition in the interior part of the orogen that contrasts with the reflectivity beneath the foreland on either side. In contrast to the foreland, which reactivates older structures and imbricates the upper crust, the internal part of the Uralides, the East Uralian Zone, is a broad, north-south crustal scale strike-slip fault system containing high grade metamorphic rocks and widespread syn- to late-orogenic granitoids. Geometrical relationships between orogen-scale strike-slip faults within the East Uralian Zone and the lower crustal reflectivity suggests that the reflectivity post-dates fault activity, indicating that some late-orogenic processes were active to modify the lower crust and Moho in this area. The outcropping geology supports the hypothesis that the conditions for lower crustal flow were met in the East Uralian Zone, and we suggest that the lower crustal reflectivity and Moho observed on the ESRU data is related to a flow channel that developed at the base of the crust in the interior of the orogen. The lower crust and Moho beneath much of the foreland appears to have been largely unaffected by the Uralide orogeny, and is likely an older feature.