

# IMPRINTS OF TECTONIC PROCESSES IMAGED WITH MAGNETOTELLURICS AND SEISMIC REFLECTION

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Co-located seismic and magnetotelluric (MT) profiles provide fundamental geophysical data sets to image the crust of Australia. Despite their overlapping nature, the data are processed and interpreted separately based on legacy workflows. We qualitatively compare 2D resistivity inversion models derived from MT and uninterpreted seismic reflection profiles across Proterozoic Australia to address the long-standing cross-cutting nature of interpreted seismic faults and low resistivity zones derived from MT. We find that a good correlation exists between high/low reflectivity in seismic sections and low resistivity in MT sections. These relationships elucidate signatures of past magmatic and fluid-related events and constrain zones of weakened rheology in the crust. Depending on their characteristics, these signatures may signify fossil melting of the crust due to underplating or magmatic invasion into the crust or reworking associated with redistribution of fluids along newly developed faults. These findings have implications for constraining mineral deposit genesis and location.