

## MT in Northern Zagros, Iran

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With recent Magnetotelluric measurements around the suture zone of the Arabian-Eurasian collision in the northern Zagros in Iran, we present the latest updates on the lithospheric structure of the region.

Two field campaigns were conducted: In 2022, 22 long-period and 22 broadband Magnetotelluric stations were deployed along two 450-km profiles crossing the Zagros, extending from southern Tehran to the western Ilam provinces. In 2024, measurements were taken around the suture zone of the same area using 11 broadband stations in Lorestan province.

Data processing was carried out using FFMT, a MATLAB-based software package for Magnetotelluric analysis developed at Frankfurt University. Transfer functions were calculated using a bivariate approach and a standard linear regression model. A significant challenge in processing the first dataset was correcting for time-dependent time shifts. These corrections were applied in the frequency domain, involving segmenting the time series data and applying adjustments to improve data quality.

Inverting tipper and off-diagonal impedance data using ModEM, reveals considerable correlations between low resistivity zones and major faults within the Zagros Fold and Thrust Belt. Additionally, the Main Zagros Thrust aligns well with high-velocity zones identified in seismic models. Notably, the processing results from the second dataset delineate an enhanced conductive crust around the suture zone. Among the possible reasons for such low resistivity we prefer the presence of graphite. This is supported by the Sanandaj-Sirjan metamorphic ranges in the Zagros, as well as the eastern range, which are prone to graphite mineralization (Several graphite reservoirs have been identified in Lorestan province).

Future work will continue to refine these models, integrating new data and enhancing our comprehension of the lithospheric dynamics in this key collision zone.