Detecting lineaments in Northern Bavaria from magnetotelluric soundings

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Northern Bavaria shows an elevated surface heatflow in combination with prominent lineaments and potentially hydraulically active tectonic faults. Sharp resistivity contrasts, as they might appear for geothermal fluids migrating along faults and altering the host rock resistivity environment, are an ideal target for electromagnetic measurements. Magnetotelluric (MT) measurements have been conducted in northern Bavaria in October 2019 for the investigation of the subsurface resistivity structure of the lineaments and faults for possibly future geothermal explorations. Magnetotelluric data sampled in highly populated areas are often contaminated with anthropogenic electromagnetic noise and result in strong outliers in the impedance tensor estimates. A robust remote reference method and several pre-stack data selection criteria have been applied in order to retrieve meaningful estimates of the impedance tensor. To derive an image of the subsurface resistivity distribution a three dimensional inverse modelling of the impedance tensor estimates has been applied.