

## The maximum possible distances to the remote reference when working in medium and high latitudes

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### SUMMARY

This work compares the maximum possible distances to a magnetotelluric remote reference when operating in middle and high latitudes. Several illustrative examples show that the maximum distances at which the magnetotelluric fields correlate strongly depend on the latitude. In 2020-2021, we took magnetotelluric measurements in Yakutia region, on the regional profile 4-SB. Profile length is 900 km. Throughout all the work, registration was carried out at a fixed remote reference site. We analyzed the efficiency of using a remote reference for sites located at different distances from it (from 0 to 650 km). Also, we analyzed quality of horizontal magnetic tensors for sites located at different distances from each other. We used all measurements along the profile, which made it possible to study in detail the correlation of fields at different distances. The work carried out showed that at latitudes of about 60 degrees it makes sense to locate a remote reference at a distance of no more than a few hundred kilometers from the measurement sites. At large distances, the correlation between low-frequency field is lost, which must be taken into account when designing work in these latitudes. When carrying out work in middle latitudes, the distances at which fields correlate are increasing, and it is possible to locate remote reference at distances up to a thousand kilometers.

**Keywords:** remote reference, horizontal magnetic tensor, data processing

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