# A robust estimation of MT transfer function using by BI (Bounded Influence) and RMP (Rejection based on Median Power) techniques

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## ABSTRACT

Robust magneto-telluric (MT) response function estimators are now in standard use in electromagnetic induction research. Properly devised and applied, these methods can reduce the influence of unusual data (outlier) in the response (electric field) variable, but often not sensitive to exceptional predictor (magnetic field) data, which are termed leverage point. A bounded influence estimator is described which simultaneously limits the influence of both outlier and leverage point, and has proven to consistently yield more reliable MT response function estimates than conventional robust approach. The bounded influence estimator combines a standard robust M-estimator with leverage weighting based on the statistics of the hat matrix diagonal, which is a standard statistical measure of unusual predictors. Further extensions to MT data analysis are proposed, including a establishment of data rejection criterion which minimize the influence of both electric and magnetic outlier in frequency domain based on statistical distribution of electromagnetic field. The rejection scheme made in this study seems to have a effective performance on eliminating both outliers in frequency domain. These developments are illustrated using real MT data.