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Processing of potential field data is commonly done by spectral methods because of their low computational complexity. However, we have studied some geostatistical methods to process the potential field data, and we find the advantages of using these spatial methods. First, we investigate transformation of data by kriging using a gravimetric model of covariance, we compare this approach with the spectral method, and we find its advantage when the data were sparse and not on a regular grid using a synthetic example as well as a field data example. Then, we use factorial kriging for noise reduction and separation of the regional and residual components. This method does not have some of the practical limitations that the spectral-based methods encounter. Finally, we determine the flexibility of interpolation using nonstationary covariances.

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