

Reconstructed abstract of the paper “Spatio-temporal filling of missing points in geophysical data sets”

Abstract

Geophysical data are often full of gaps, due to measurement conditions. In this work, we apply the singular spectrum analysis (SSA) method to fill in gaps. For a multivariate data we use M-SSA takes advantage of spatial and temporal correlations. SSA relies on embedding a time series into a high-dimensional vector space. The time series parts can be reconstructed by linear combinations of principal components. The method's efficiency was evaluated and improved by cross-validation. Finally, the research demonstrated that SSA is a promising approach for addressing gaps in geophysical data.

Keywords: singular spectrum analysis, principal components, time series, eigenvalues, periodic eigenvectors, spatial and temporal correlations

Highlights:

1. Using singular spectrum analysis to fill the gaps in geophysical data.
2. The time series parts can be reconstructed by linear combinations of principal components.
3. SSA is a data-adaptive, nonparametric method based on embedding a time series in a vector space.

1 Introduction

This article[1] carries a completely new, flexible and non-parametric method for filling in gaps in geophysical data. Improving the data will simplify the process and increase the quality of research.

References

- [1] Dmitri Kondrashov and Michael Ghil. Spatio-temporal filling of missing points in geophysical data sets. *Nonlinear Processes in Geophysics*, 13(2):151–159, 2006.