

Geosci. Model Dev. Discuss., referee comment RC2
<https://doi.org/10.5194/gmd-2021-174-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on gmd-2021-174

Anonymous Referee #2

Referee comment on "SciKit-GStat 1.0: a SciPy-flavored geostatistical variogram estimation toolbox written in Python" by Mirko Mälicke, Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-174-RC2>, 2022

Overview:

The author presents a SciPy flavoured python package, SciKit-GStat, for variogram estimation and plotting. Variograms are suitable for describing the spatial continuity and covariance of data and are essential for geostatistical analysis. The package is built on top of a number of popular data science packages in python such as matplotlib, NumPy, Numba (for improved computational efficiency) and Plotly etc. The package is extensible, easy to use and follows an object-oriented approach for usage. The package is also documented well and provides an easy interface with other packages for geostatistical analysis.

Although the manuscript is well written and provides a good understanding of the SciKit-GStat package, the manuscript needs further revisions before it can be accepted for publication.

Suggestion/Queries for the author:

- There are a few writing errors as highlighted in other comments. The explanation of some of the figures is not clear (Fig 3 and 4). Additionally, the accompanying text should also be improved in clarity.
- In section 3.4, the default 3D plot and contour plot of Spatio-temporal variograms are presented. However, the text does not explain the data used for this analysis. Simply mentioning the source paper is not enough.
- I suggest the authors add variogram analysis' for more complex datasets that better represent the real-world geostatistic analysis as opposed to a simple dataset like pancake.
- From my understanding, SciKit-GStat comes with four model fitting algorithms (aside

from the approach where the user sets the hyperparameters). However, the author compares the four different distance-based weighting functions only with the Trust-Region Reflective fitting procedure. Was there a reason for choosing this specific procedure for the comparison?

Additionally, why is there no comparison presented between the different fitting procedures?