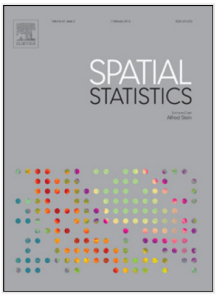
Accepted Manuscript



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PII: S2211-6753(16)30117-8
DOI: http://dx.doi.org/10.1016/j.spasta.2017.04.001
Reference: SPASTA 223

To appear in: *Spatial Statistics*

Received date: 28 October 2016
Accepted date: 5 April 2017

Please cite this article as: Fernández-Casal, R., Castillo-Páez, S., García-Soidán, P., Nonparametric estimation of the small-scale variability of heteroscedastic spatial processes. *Spatial Statistics* (2017), http://dx.doi.org/10.1016/j.spasta.2017.04.001

Nonparametric estimation of the small-scale variability of heteroscedastic spatial processes

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Abstract

The current study aims to provide nonparametric estimators of the conditional variance and the dependence structure of a heteroscedastic spatial process. When assuming zero mean along the domain, the approximation of the variance can be addressed by linear smoothing of the squared observations. Then, the variogram can be estimated from the standardized data. In the presence of a non-zero deterministic trend, we suggest a modification of the latter method that involves the residuals obtained from a local linear estimation of the trend, together with corrections of the biases derived from the use of these residuals. This work includes the results of numerical studies carried out to check the performance of the proposed approach. In addition, the proposed methodology is applied to monthly precipitation data collected on the continental part of USA.

Keywords: Bias correction, heteroscedasticity, local linear estimation, variogram

2010 MSC: 62H11, 62G05

1. Introduction

For inference on geostatistical data, the underlying random process is usually assumed to be homoscedastic and, therefore, that the variance of the spatial

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