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Mantel test for spatial functional data. An application to infiltration curves. (English)

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Summary: Statistics for spatial functional data is an emerging field in statistics which combines methods of spatial statistics and functional data analysis to model spatially correlated functional data. Checking for spatial autocorrelation is an important step in the statistical analysis of spatial data. Several statistics to achieve this goal have been proposed. The test based on the Mantel statistic is widely known and used in this context. This paper proposes an application of this test to the case of spatial functional data. Although we focus particularly on geostatistical functional data, that is functional data observed in a region with spatial continuity, the test proposed can also be applied with functional data which can be measured on a discrete set of areas of a region (areal functional data) by defining properly the distance between the areas. Based on two simulation studies, we show that the proposed test has a good performance. We illustrate the methodology by applying it to an agronomic data set.

MSC:

62M10 Time series, auto-correlation, regression, etc. in statistics (GARCH)
62H20 Measures of association (correlation, canonical correlation, etc.)
62P30 Applications of statistics in engineering and industry; control charts
86A32 Geostatistics

Cited in **2** Documents

Keywords:

[mantel test](#); [spatial autocorrelation](#); [spatial functional data](#)

Software:

[R](#); [MASS \(R\)](#); [geoR](#); [fda \(R\)](#)

Full Text: [DOI](#)

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