SEMINÁRIOS

SÉRIES TEMPORAIS, ONDALETAS E DADOS FUNCIONAIS

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A SPLINE-BASED APPROACH TO SPATIALLY CONFOUNDED LINEAR REGRESSION OF GEOSTATISTICAL DATA
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For spatial linear regression, the traditional approach is to use a parametric linear mixed-effects model such that spatial dependence is captured as a spatial random effect that is a Gaussian process with mean zero and a parametric covariance function. Spline surfaces can be used as an alternative approach to capture spatial variability, giving rise to a semiparametric method that does not require the specification of a parametric covariance structure. The spline component in such a semiparametric method, however, impacts the estimation of the regression coefficients. In this paper, we investigate such an impact in spatial linear regression with spline-based spatial effects. Statistical properties of the regression coefficient estimators are established under the model assumptions of the traditional spatial linear regression. We also develop a method to choose the tuning parameter for the smoothing splines that is tailored toward drawing inference about the regression coefficients. Further, we examine the empirical properties of the regression coefficient estimators under spatial confounding. A data example in precision agriculture research regarding soybean yield in relation to field conditions is presented for illustration.