Nonstationary spatial-temporal covariance models for processes on a globe

by

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Abstract

We present a class of parametric covariance functions for spatial-temporal processes on a globe. This model class is an extension from the previous works in Jun and Stein (2007, 2008). The proposed models are flexible in producing nonstationarity in space, in particular with respect to latitude, which is common to processes in geophysical problems. The models are able to capture complex space-time interactions in the covariance structure with modest number of covariance parameters. We apply our model to TOMS ozone data and discuss computational method for fast and efficient computation of the likelihood using complex normal random variable. We will also discuss some interesting features of the mean structure of the data.