Testing separability in spatial-temporal processes

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Abstract: Spatial-temporal correlated data are quite common in many fields, such as ecology, methereology or environmental science. In this case, a key hypothesis to be tested is the separability of the process, which means that the spatial and the temporal correlation components can be modelled independently. In this work, we propose a testing technique for detecting separability in the spatial-temporal dependence structure. Our approach is based on the representation of the log-periodogram as the response variable in a regression model. Within this context, separability can be interpreted as additivity in spatial and temporal frequency components.

Keywords: additive models; separability; spatial-temporal process; spectral domain.