

On nonstationary subspace analysis for multivariate random fields

Jaakko Pere¹, Perttu Saarela², Sandra De Iaco³, and
Klaus Nordhausen²

¹*School of Business, Aalto University, Finland*

²*Department of Mathematics and Statistics, University of Helsinki, Finland*

³*Department of Economic Sciences, University of Salento, Italy*

Abstract

The analysis of multivariate spatiotemporal data can potentially be simplified by applying a blind source separation model for a random field. Here we consider a particular linear blind source separation model in which the unobserved multivariate latent field includes stationary and nonstationary components. For the presented model, we establish identifiability conditions. Furthermore, we consider basic asymptotics for a diagonalization-based estimator of subspace spans. The diagonalized matrix is constructed by comparing local spatial statistics to the corresponding global statistic.

Keywords

Blind Source Separation, Multivariate Random Field, Independent Subspace Analysis, Nonstationarity.