

Selecting models with different spectral density matrix structures by the cross-validated log likelihood criterion

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We propose the cross-validated log likelihood (CVLL) criterion for selecting multivariate time series models with different forms of the spectral density matrix, which correspond to different constraints on the component time series such as mutual independence, separable correlation, time reversibility, graphical interaction and others. We obtain asymptotic properties of the CVLL, and demonstrate the empirical properties of the CVLL selection with both simulated and real data.

Keywords: conditional independence; consistency; graphical model; Kullback–Leibler divergence; model selection; multivariate time series; periodogram; spectral density matrix