A Class of Semiparametric Estimator for Long-Range Dependent Multivariate Processes

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In this work we investigate the finite sample performance of a certain class of Gaussian Semiparametric Estimators (GSE) for the memory parameter in long-range dependent multivariate time series. The class of models considered here satisfies simple conditions on the spectral density function, restricted to a small neighborhood of the zero frequency. This includes, but is not limited to, the class of VARFIMA models. We present a simulation study to assess the finite sample properties of the proposed estimator in the context of bivariate VARFIMA(0, d, 0) processes for which the innovation’s joint distribution is Gaussian, but the marginals are not. Marginal distributions considered here present heavier tails than the standard Gaussian distribution and include the Student’s t, the Logistic and the hyperbolic-Secant distributions.

Keywords: Multivariate processes; Long-range dependence; Semiparametric estimation.