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Statistical Inference for Stationary Processes and Fields Using Higher Order Information

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Statistical techniques making use of higher-order moments/cumulants and higher-order spectra are of great demand in many fields of applications, which include: geophysics, astronomy, oceanography, sonar, communications, image processing, fluid mechanics, turbulence, economics and finance. We present an approach for statistical parameter estimation of random processes and fields based on higher-order information which has been elaborated in the papers Anh, Leonenko and Sakhno. The proposed method extends the idea of quasilielihood in such a way that the estimating function (minimum contrast functional) is generated from the information on higher-order spectral densities. We provide the results on asymptotic properties of the estimates and some applications.