

A Frequency Domain Empirical Likelihood Method for Irregularly Spaced Spatial Data*

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ABSTRACT

In this talk, we consider empirical likelihood methodology for irregularly spaced spatial data in the frequency domain. The main result of the paper shows that upto a suitable (and nonstandard) scaling, Wilk's phenomenon holds for the logarithm of the empirical likelihood ratio in the sense that it is asymptotically distribution free and has a chi-squared limit. As a result, the proposed spatial FDEL method can be used to build nonparametric, asymptotically correct confidence regions and tests for a class spectral parameters that are defined through spectral estimating equations. A major advantage of the method is that unlike the more common studentization approach, it does not require explicit estimation of the standard error, which itself is a difficult problem due to intricate interactions among several unknown quantities, including the spectral density of the spatial process, the spatial sampling density and the spatial asymptotic structure. Applications of the methodology to some important inference problems for spatial data are given.

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