

## Fourier methods for model selection

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**Abstract** A test approach to the model selection problem based on characteristic functions (CFs) is proposed. The scheme is close to that proposed by Vuong (*Econometrica* 57:257–306, 1989), which is based on comparing estimates of the Kullback–Leibler distance between each candidate model and the true population. Other discrepancy measures could be used. This is specially appealing in cases where the likelihood of a model cannot be calculated or even, if it has a closed expression, it is either not easily tractable or not regular enough. In this work, the closeness is measured by means of a distance based on the CFs. As a prerequisite, some asymptotic properties of the minimum integrated squared error estimators are studied. From these properties, consistent tests for model selection based on CFs are given for separate, overlapping and nested models. Several examples illustrate the application of the proposed methods.

**Keywords** Empirical characteristic function · Model selection · Misspecified models