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On estimating the cumulant generating function of linear processes

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Abstract We compare two estimates of the cumulant generating function of a stationary linear process. The first estimate is based on the empirical moment generating function. The second estimate uses the linear representation of the process and the empirical moment generating function of the innovations. Asymptotic expressions for the mean square errors are derived under short- and long-range dependence. For long-memory processes, the estimate based on the linear representation turns out to have a better rate of convergence. Thus, exploiting the linear structure of the process leads to an infinite gain in asymptotic efficiency.

Keywords Empirical moment generating function · Long-range dependence · Short-range dependence.