

Hypothesis testing for families of ergodic processes

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General sufficient conditions for the discernibility of two families of stationary ergodic processes are derived. The conditions involve the weak topology for stationary processes. They are analogous in several respects to existing conditions for the discernibility of families of independent and identically distributed (i.i.d.) processes, but require a more refined type of topological separation in the general case. As a first application of the conditions, it is shown how existing discernibility results for i.i.d. processes may be extended to a countable union of uniformly ergodic families. In addition, it is shown how one may use hypothesis testing to study polynomial decay rates for covariance-based mixing conditions.

Keywords: discernibility; ergodic processes; hypothesis testing; mixing conditions; process families