

Abstract

Title: Stability and spatial adaptivity in high dimension

Given a d -dimensional process, we are interested in analysing its stability properties over the time horizon. The main objective is to find the anomalous single components, that is, the set of coordinates where the behaviour of the process changes significantly. Based on high-dimensional limit results, we obtain globally optimal tests and estimators. In particular, we show that the usual price of $\sqrt{\log(d)}$ is unavoidable in general. We then proceed by showing that the power can be significantly improved by exploiting the underlying covariance structure, and that the minimax rate can generally be expressed in terms of certain quantiles. Corresponding tests and estimators can be constructed based on a bootstrap-procedure, adapting to the covariance structure. A key aspect that we exploit here is an interesting probabilistic feature of the quantiles, a quasi-exponential invariance in their significance level α .