Recursive estimation of smoothly time-varying autoregressive processes.

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First we slightly revisit the definition of locally stationary time-varying autoregressive (TVAR) processes introduced by Rainer Dahlhaus. The AR parameters are equispaced samples of a multivariate function $\boldsymbol{\theta}(t)$ defined over $t \in [0, 1]$. Standard assumptions on $\boldsymbol{\theta}$ are imposed so that the parameters evolve smoothly along time. In contrast to the usual spectral approach, we use Markovian techniques for treating the stability issue.

Then we address the problem of estimating the unknown $\boldsymbol{\theta}$ from an observed trajectory of a TVAR process in a classival non-parametric estimation framework. We will discuss the benefits of this framework in the context of recursive estimation through the particular case of the normalized least mean square estimator that we studied with Eric Moulines (Télécom Paris) and Pierre Priouret (Université Paris 6).