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Dynamic detection of change points in long time series

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Abstract We consider the problem of detecting change points (structural changes) in long sequences of data, whether in a sequential fashion or not, and without assuming prior knowledge of the number of these change points. We reformulate this problem as the Bayesian filtering and smoothing of a non standard state space model. Towards this goal, we build a hybrid algorithm that relies on particle filtering and Markov chain Monte Carlo ideas. The approach is illustrated by a GARCH change point model.

Keywords Change point models · GARCH models · Markov chain Monte Carlo · Particle filter · Sequential Monte Carlo · State state models