Approximate Bayesian inference for multiple changepoint models with dependence within segments

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This paper proposes approaches for the analysis of multiple changepoint models when dependency in the data is modelled through a hierarchical Gaussian Markov random field. Integrated nested Laplace approximations are used to approximate data quantities, and an approximate filtering recursions approach is used which results in a computational saving when detecting changepoints. Analysis of real data demonstrates the usefulness of this approach. The new models which allow for data dependence are compared with conventional models where data within segments is assumed independent. This work is in collaboration with Jason Wyse (Trinity College, Dublin) and Håvard Rue (NTNU, Trondheim).