

# Workshop in Stochastic Analysis and Applications

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## Minimal Markov model for a set of Markov chains

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### Abstract

We define a family of Markov models for a set of Markov chains over the same finite alphabet  $A$  and develop a model selection procedure for this family of models. The methodology is based on the Bayesian Information Criterion (BIC) by Schwarz. The procedure consists of identifying all the elements on the state spaces of the Markov chains having the same transition probabilities. This identification allows us to build a partition of the set of state spaces, such that two states are in the same part if and only if they have equal transition probabilities. Formulating the joint model in this way, the number of parameters is minimized since for each part we need  $(|A| - 1)$  parameters. The joint model developed here is a generalization of the partition Markov models by García and González-López.