

# Uncovering hidden new physics patterns in jets using Bayesian probabilistic models

*Friday, 31 July 2020 12:45 (15 minutes)*

We apply techniques from Bayesian generative probabilistic modelling to discover hidden features in jet sub-structure observables. We show that our method is able to discriminate between different unknown short distance physical processes in events at the LHC. In particular, we use a mixed membership model known as Latent Dirichlet Allocation to model the main features appearing during jet formation that are necessary for unsupervised jet or event classification tasks. We demonstrate the potential for discovering without supervision a hidden New Physics signature from a heavy  $W$  prime decay chain in multi-jet events. We also briefly discuss how both parametric and non-parametric Bayesian probability models can be used for clustering jets or modelling generic events at hadron colliders.

## I read the instructions

### Secondary track (number)

14

**Primary authors:** KAMENIK, Jernej; DILLON, Barry; Dr FAROUGHY, Darius

**Presenter:** Dr FAROUGHY, Darius

**Session Classification:** Beyond the Standard Model

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