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## Modeling Smooth Backgrounds at Collider Experiments With Log Gaussian Cox Processes

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Background modeling is one of the critical elements of searches for new physics at experiments at the Large Hadron Collider. In many searches, backgrounds are modeled using analytic functional forms. Finding an acceptable function can be complicated, inefficient and time-consuming. This poster presents a novel approach to estimating the underlying PDF of a 1D dataset of samples using Log Gaussian Cox Processes (LGCP). Using LGCP allows inferring a posterior distribution for the PDF, and unlike a Gaussian Process fit, it does not require binning the dataset. Markov Chain Monte Carlo (MCMC) is used to optimize the LGCP fit. The final result is a fit model which is highly flexible, does not rely on an analytic fit assumption, and carries uncertainty bands.

**Presenter:** FRID, Yuval Yitzhak (Tel Aviv University (IL))

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