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Colibri: a flexible framework for Bayesian analysis in PDF fits

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Accurately propagating uncertainties is essential for parton distribution functions (PDFs), particularly with the high-precision data expected from the HL-LHC. Traditional methodologies often struggle with strong non-linear dependencies in parameters, underscoring the need for innovative approaches. In this talk, we introduce Colibri, a flexible Bayesian analysis framework for PDFs, enabling simple implementation of diverse PDF models.
As a key application, we discuss a model allowing for realistic global PDF analyses by parameterizing PDFs with a linear model, showcasing how the Bayesian workflow facilitates robust model selection. We will showcase state-of-the-art results, highlighting the framework's potential for simultaneous determination of PDF parameters and SM (or BSM) ones, paving the way for advancements in the high-precision era.

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