Contribution ID: **23**   Type: **not specified**

Bayesian Inference for Four tops at the LHC

Thursday 23 September 2021 11:25 (25 minutes)

Four-top production is one of the last benchmarks of the SM explored at the LHC, and the intersection of state of the art experimental techniques and theoretical calculations. In this talk, we give a brief review of the main problems one faces when trying to disentangle signal from background in such a complex final state with a special empashisis on the role of Monte Carlo simulations. We then propose a relatively simple probabilistic mixture model where these simulations play the role of prior knowledge that can be updated with standard Bayesian techniques. Using a simulated dataset with deliberately untuned priors, we demonstrate that our method can mitigate the effects of large MC mismodellings leading to corrected posterior distributions that better approximate the underlying truth-level spectra, opening the door for a reduction of simulation systematics and a higher sensitivity to possible BSM effects.

Authors: DILLON, Barry (University of Heidelberg); LAMAGNA, Federico; FAROUGHY, Darius (University of Zurich); ALVAREZ DE LOS ALVAREZ DE SAN LUIS, Ezequiel; FESEL KAMENIK, Jernej (Jozef Stefan Institute (SI)); SZEWC, Manuel (ICAS-UNSAM)

Presenter: SZEWC, Manuel (ICAS-UNSAM)

Session Classification: Collider physics

Track Classification: Collider physics