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How Good is the Standard Model?

Wednesday, 26 October 2022 10:00 (30 minutes)

Strategies to detect data departures from a given reference model, with no prior bias on the nature of the new physical model responsible for the discrepancy might play a vital role in experimental programs where, like at the LHC, increasingly rich experimental data are accompanied by an increasingly blurred theoretical guidance in their interpretation. I will describe one such strategy that employs neural networks, leveraging their virtues as flexible function approximants, but builds its foundations directly on the canonical likelihood-ratio approach to hypothesis testing. The algorithm compares observations with an auxiliary set of reference-distributed events, possibly obtained with a Monte Carlo event generator. It returns a p-value, which measures the compatibility of the reference model with the data. It also identifies the most discrepant phase-space region of the dataset, to be selected for further investigation. Imperfections due to mismodelling in the reference dataset can be taken into account straightforwardly as nuisance parameters.

Experiment context, if any

References

Significance

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Session Classification: Plenary