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Accelerating the BSM interpretation of LHC data with machine learning

The interpretation of Large Hadron Collider (LHC) data in the framework of Beyond the Standard Model (BSM) theories is hampered by the need to run computationally expensive event generators and detector simulators. Performing statistically convergent scans of high-dimensional BSM theories is consequently challenging, and in practice unfeasible for very high-dimensional BSM theories. We have applied machine learning methods to accelerate the interpretation of LHC data, by learning the relationship between BSM theory parameters and data. The new approach makes it possible to rapidly and accurately reconstruct the theory parameters of complex BSM theories, should an excess in the data be discovered at the LHC.

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