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Analysis of Frequentest Study Results in Quantifying Fake Signal Generated in the Training of Semi-Supervised DNN Classifiers

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In searches for physics beyond the Standard Model, BSM, machine learning classifiers are used to extract signal from background processes. The use of semi-supervised classifiers allows unlabelled signal events to be classified from labelled background events. This method minimises biases caused by preconceived understanding of the signal. During the training of machine learning classifiers, events can be misclassified. Misclassified events can take the form of fake signals which influence the extent of discovery significance in resonance searches. This study therefore measures the extent of fake signal generated in the training of semi-supervised DNN classifiers using a frequentest methodology. In this study the methodology and results of the experiment are explored using $Z\gamma$ final state data, at a fixed centre of mass of 150GeV. The results quantify the extent of fake signal generated as well as account for the probability of observing local excesses, elsewhere within the mass range.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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