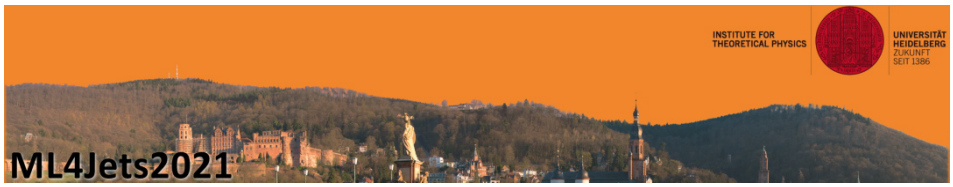


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# Parametrized classifiers for optimal EFT sensitivity

*Tuesday, July 6, 2021 4:40 PM (20 minutes)*

We study unbinned multivariate analysis techniques, based on Statistical Learning, for indirect new physics searches at the LHC in the Effective Field Theory framework. We focus in particular on high-energy ZW production with fully leptonic decays, modeled at different degrees of refinement up to NLO in QCD. We show that a considerable gain in sensitivity is possible compared with current projections based on binned analyses. As expected, the gain is particularly significant for those operators that display a complex pattern of interference with the Standard Model amplitude. The most effective method is found to be the "Quadratic Classifier" approach, an improvement of the standard Statistical Learning classifier where the quadratic dependence of the differential cross section on the EFT Wilson coefficients is built-in and incorporated in the loss function. We argue that the Quadratic Classifier performances are nearly statistically optimal, based on a rigorous notion of optimality that we can establish for an approximate analytic description of the ZW process.

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