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Searching for new physics using hadronic decays of W and Z bosons in the ATLAS detector

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Fully hadronic decays of diboson (WW, ZZ, WZ) pairs into large-R jets may be more sensitive to currently undiscovered phenomena. As weak bosons are able to interact with spin-0, spin-1 and spin-2 particles, they act as a good tool for probing resonances of new physics beyond the standard model. Due to its large branching fraction, studying the hadronic channels is advantageous, as it can yield a higher energy reach with respect to the semi and fully leptonic channels. In order to distinguish signal events from the large background of standard model dijet events, a machine-learning-based and mass-decorrelated large-R jet tagger, with optimized working points, is used. The fit strategy is validated using a background estimation in signal regions via an ABCD method. This method determines the background in both the low-purity and the high-purity regions, as defined by different boson tagger working points. This analysis, which represents a second pass over the full ATLAS Run 2 dataset, is expected to significantly improve over the previous full Run 2 ATLAS result in this channel. This talk will focus on the background estimation procedure, which plays a crucial role in the success of this analysis.

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