

Triggering on hadronic signatures in ATLAS – developments for 2017 and 2018

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Hadronic signatures are critical to the ATLAS physics program, and are used extensively for both Standard Model measurements and searches for new physics. These signatures include generic quark and gluon jets, as well as jets originating from b-quarks or the decay of massive particles (such as electroweak bosons or top quarks). Additionally, missing transverse momentum from non-interacting particles provides an interesting probe in the search for new physics beyond the Standard Model. Developing trigger selections that target these events is a huge challenge at the LHC due to the enormous rates associated with hadronic signatures. This challenge is exacerbated by the amount of pile-up activity, which continues to grow. In order to address these challenges, several new techniques were developed to significantly improve the potential of the 2017 dataset. This talk presents an overview of how we trigger on hadronic signatures at the ATLAS experiment, outlining the challenges of hadronic object triggering and describing the improvements performed over the course of the Run-2 LHC data-taking program. The performance in Run-2 data is shown, including demonstrations of the new techniques being used in 2017. We also discuss further critical developments implemented for the rest of Run-2 and their performance in early 2018 data.

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