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b-jet triggering in ATLAS: from algorithm implementation to physics analyses

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The online event selection is crucial to reject most of the events containing uninteresting background collisions while preserving as much as possible the interesting physical signals. The b-jet selection is part of the trigger strategy of the ATLAS experiment and a set of dedicated triggers is in place from the beginning of the 2011 data-taking period and is contributing to keep the total bandwidth to an affordable rate. The b-jets acceptance is increased and the background reduced by lowering jet transverse energy thresholds at the first trigger level and applying b-tagging techniques at the subsequent levels. Different physics channels, especially topologies containing more than one b-jet where higher rejection factors are achieved, benefit from requesting this trigger to be fired. An overview of the status-of-art of the b-jet trigger menu and the performance on real data is presented in this contribution. Data-driven techniques to extract the online b-tagging efficiency and mis-tag rate, key ingredients for all analyses relying on such triggers, are also discussed and results presented.

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