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Measurement of the combined online and offline b-jet identification efficiency with $t\bar{t}$ events using a likelihood method in the ATLAS detector

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The identification of jets coming from the hadronization of b-quarks (b-tagging) is instrumental for many physics analyses performed at the Large Hadron Collider. ATLAS has b-tagging capability starting at trigger level, where b-tagging algorithms are fed with tracks that are reconstructed at the High-Level Trigger stage. Physics analyses with b-jets in the final state, but no lepton or missing transverse energy, benefit from using b-jet identification at trigger level in order to improve the signal efficiency. In Run 2, b-jet trigger efficiency is measured using a data sample enriched in $t\bar{t}$ di-leptonic events, employing a likelihood method. The b-tagging efficiency, for trigger algorithms as well as for the combination between trigger and offline algorithms, is extracted for jets in a transverse momentum range from 35 to 600 GeV, and data-to-simulation scale factors are derived.

Author: BARTOLINI, Giovanni (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

Presenter: BARTOLINI, Giovanni (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

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