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Fragmentation studies with the ATLAS detector

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Abstract: Gluon splitting to b-quark pairs is a unique probe into the properties of gluon fragmentation, as identified b-tagged jets provide a proxy for the quark daughters of the initial gluon. If available, we present a measurement of key differential distributions related to $g \rightarrow b \bar{b}$ using data collected with the ATLAS detector at $\sqrt{s}=13$ TeV. Track jets are used to probe angular scales below the standard $R=0.4$ jet radius. The observables are unfolded to particle level in order to facilitate direct comparison with predictions from simulations and provide an important constraint to hadronization models.

If available, a measurement of the properties of jet fragmentation performed with pp data collected with the ATLAS detector at $\sqrt{s}=13$ TeV is presented. Charged particle tracks are used to measure charged particle multiplicity, the jet charge, the summed fragmentation function, the momentum transverse to the jet axis, and the radial profile of the jet. Each observable is unfolded to correct for acceptance and detector effects. Exclusive interpretations in terms of quarks and gluons are provided in order to directly compare with state-of-the-art calculations.

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