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Measurement of the primary Lund jet plane density in proton-proton collisions at $\sqrt{s} = 13$ TeV

A measurement of the primary Lund jet plane density in inclusive jet production in proton-proton collisions is presented. The analysis uses 138 1/fb of data collected by the CMS experiment at 13 TeV. The Lund jet plane, a representation of the phase space of emissions inside jets, is extracted using iterative jet declustering. The transverse momentum k_T and the splitting angle ΔR of an emission relative to its emitter are measured at each step of the jet declustering process. The average density of emissions in $\ln(k_T/\text{GeV})$ and $\ln(R/\Delta R)$ is measured for jets with distance parameters $R = 0.4$ or 0.8 and transverse momentum $p_T > 700$ GeV and rapidity $|y| < 1.7$. The jet substructure is extracted using the charged-particle tracks of the jet to achieve optimal momentum and angular resolution. The measured distributions are unfolded to the level of stable particles. The measurement is compared with theoretical predictions from state-of-the-art simulations.

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