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Quark gluon tagging at the LHC

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By measuring the substructure of a jet, one can assign it a quark or gluon tag. In this talk, we confront the challenges faced when going beyond this leading-order understanding, using both parton shower generators and first-principles calculations to assess the impact of higher-order perturbative and nonperturbative physics. Working in the idealised context of electron-positron collisions, where one can define a proxy for quark and gluon jets based on the Lorentz structure of the production vertex, we find a fascinating interplay between perturbative shower effects and nonperturbative hadronization effects. Turning to proton-proton collisions, we highlight a core set of measurements that would constrain current uncertainties in quark/gluon tagging and improve the overall modeling of jets at the Large Hadron Collider.

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Yes

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