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The high-energy QCD dynamics from Higgs-plus-jet correlations at FCC collision energies

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Recent analyses on high-energy inclusive Higgs-boson rates in proton collisions via the gluon fusion channel, matched with the state-of-the-art fixed-order $N^3\text{LO}$ accuracy, have shown that the impact of high-energy resummation corrections reaches 10% at the FCC nominal energies. This supports the statement that electroweak physics at 100 TeV is expected to receive relevant contributions from small- x physics. In this talk we will present novel predictions for transverse-momentum and rapidity distributions sensitive to the inclusive emission of a Higgs boson in association with a light-flavored jet in proton collisions, calculated within the NLL accuracy of the energy-logarithmic resummation. We will highlight how high-energy signals for this process are already present and visible at current LHC energies, and they become very important at FCC ones. We come out with the message that the improvement of fixed-order calculations on Higgs-sensitive QCD distributions is a core ingredient to reach the precision level of the description of observables relevant for the Higgs physics at the FCC.

Primary authors: PAPA, Alessandro; Dr CELIBERTO, Francesco Giovanni (ECT*/FBK Trento & INFN-TIFPA)

Presenter: Dr CELIBERTO, Francesco Giovanni (ECT*/FBK Trento & INFN-TIFPA)

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