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Extensions of MadGraph5_aMC@NLO for QCD studies

In this talk, I will present our extensions of MadGraph5_aMC@NLO for two
asymmetric systems, photoproduction and proton-nucleus collisions, as well as progress towards automation
of computations for inclusive-quarkonium production, currently being worked out at leading order.
Indeed, to consolidate the figures of merit of a variety of measurements at the Electron-Ion Collider and
systematise data-theory comparisons at the LHC, it is essential to include radiative corrections in simulations
of electron-proton,electron-nucleus and proton-nucleus collisions. Such an automation is currently achieved
at NLO in the fixed-order mode within MadGraph5_aMC@NLO.
Extensive validations for hard reactions, like charm, beauty, Drell-Yan-pair,Z and W boson production, will
be shown as well as predictions for future measurements.

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