

# Nuclear glue constraints from top-quark pair production in p-A and A-A collisions at the LHC and beyond

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I will present phenomenological studies of top-quark pair production in p-Pb and Pb-Pb collisions at the CERN LHC and at the future circular collider (FCC), obtained with NLO pQCD calculations including nuclear PDFs. In their fully-leptonic decay mode ( $t\bar{t} \rightarrow W+W-b\bar{b} \rightarrow l+l-\nu\nu\bar{b}\bar{b}$ ), one expects 90 (Pb-Pb) and 300 (p-Pb) top-quarks cleanly tagged per nominal LHC-year, and 47,000–100,000 per FCC-year at  $\sqrt{s_{NN}} = 39, 63$  TeV, after typical ATLAS/CMS-like acceptance and efficiency cuts. Using a Hessian PDF reweighting technique, we demonstrate that the rapidity distributions of the  $t\bar{t}$  decay leptons provide quantitative constraints of the Pb gluon density at high virtualities, whose uncertainty can be reduced by up to 30% at the LHC (full heavy-ion programme), and by 70% per FCC-year [1].

[1] D. d'Enterria, K.Krajczar, H.Paukkunen, Phys. Lett. B746 (2015) 64-72; arXiv:1501.05879

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