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## Higgs boson and top-quark in nuclear collisions

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Top-quark, Higgs boson, heavy-ions

### Summary

Prospects for the observation of the heaviest elementary particles known, the top-quark and the Higgs boson, in p-Pb and Pb-Pb collisions at the CERN LHC and at the future circular collider (FCC) will be presented based on NLO pQCD calculations including nuclear PDFs. On the one hand, one expects 90 (Pb-Pb) and 300 (p-Pb) top-quarks observed 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 in the fully-leptonic final-state, unaffected by final-state interactions, providing valuable constraints of the Pb gluon density at high virtualities [1]. On the other hand, a 5-sigma observation of the Higgs boson in nuclear (gluon-gluon) collisions is perfectly feasible at the FCC, and could be attempted at the LHC in p-Pb at 8.8 TeV accumulating  $30 \text{ pb}^{-1}$  [2]. The interesting physics motivations of a Higgs boson measurement in heavy-ion collisions will be presented.

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

[2] D. d'Enterria, in preparation.

### Presentation type

Oral

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