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ϕ production at forward rapidity in pp, pPb and PbPb collisions with ALICE

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Light vector meson (ρ, ω, ϕ) production provides key information on the hot and dense state of strongly interacting matter produced in high-energy heavy-ion collisions. In particular, strangeness production can be accessed through the measurement of the ϕ meson, while the detailed description of the full dimuon mass spectra can be used to reveal in-medium modifications of hadron properties and thermal emission arising from the medium. The detection of vector mesons through their decay in dileptons has the advantage, with respect to hadronic channel, that the decay products are not affected by final state interactions.
Measurements in pp and p-A systems, where hot nuclear matter effects are not expected, are used as a reference.

The ALICE experiment at the LHC can access vector mesons produced at forward rapidity through their decays in muon pairs. We present results on vector meson production in p-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV, pp and Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$˜TeV. In pp collisions the ϕ differential cross section as a function of $p_{\rm T}$ was measured in the range $1 \leq p_{\rm T}$ 5 GeV/c and compared with the calculations from PHOJET and PYTHIA.
In p-Pb collisions, measurements of the ϕ yield and the nuclear modification factor in the rapidity ranges $2.03 \leq y \leq 3.53$ (p-going direction) and $-4.46 \leq y \leq -2.96$ (Pb-going direction) are shown. An asymmetry between the cross section at forward and backward rapidity is observed. Results are compared to the predictions provided by commonly used event generators.
In Pb-Pb collisions, the ϕ yield and the nuclear modification factor are obtained as a function of centrality in the intermediate $p_{\rm T}$ region ($2 \leq p_{\rm T} \leq 5$ GeV/c) and for $2.5 \leq y \leq 4$. Differences are observed between these results and those measured in the same $p_{\rm T}$ range at midrapidity in the KK channel.

On behalf of collaboration:

ALICE

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