



Contribution ID: 498

Type: Oral presentation

## Investigating cold nuclear matter effects in charmonia and Drell-Yan processes at the fixed-target COMPASS experiment

Wednesday, 6 April 2022 11:50 (20 minutes)

Suppression of charmonia is one of the most distinctive signatures of Quark-Gluon Plasma (QGP) in heavy-ion collisions. Suppression can also take place in hadron-nucleus collisions due to cold nuclear matter (CNM) effects where the presence of QGP is not expected. The hadron-nucleus collisions are therefore important as they help to disentangle the effects of the QGP from those due to CNM. Charmonium production in hA collisions at fixed-target energies is sensitive to the effects of nPDF and the partonic energy loss in nuclear matter. It is conveniently complemented by the well-known Drell-Yan process.

The double differential ( $x_F$ ,  $p_T$ ) cross-sections of  $J/\psi$  production and Drell-Yan process have been measured by the COMPASS collaboration in hA collisions at  $\sqrt{s} = 18.9$  GeV. A negative pion beam with a momentum of 190 GeV/c was impinging on ammonia, aluminum, and tungsten targets. The preliminary results for the ratios of heavy to light targets for both charmonia production and Drell-Yan show suppression towards high  $x_F$ . A dependence with  $p_T$  is also investigated, which might indicate the presence of energy loss effects. COMPASS findings on the nuclear effects of the  $J/\psi$  production and Drell-Yan process will be presented. The results will be compared to the available fixed-target and collider measurements in order to explore scaling behavior and energy dependence and will be followed by the comparison with theoretical model predictions.

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**Session Classification:** Parallel Session T02: Chirality, vorticity and spin polarization

**Track Classification:** Heavy flavors, quarkonia, and strangeness production