Contribution ID: **6** Type: **not specified**

D-meson observables in p-Pb collisions at LHC with MC@sHQ+EPOS3 model

Thursday 30 July 2015 14:30 (30 minutes)

The first experimental results from pPb collisions at 5 TeV on the particle yields and azimuthal anisotropies as function of transverse momentum show a very similar behavior in comparison to the observations in heavy-ion collisions, where the quark-gluon plasma (QGP) can be produced. Such pPb results have indeed been explained in the framework of models including a QGP phase such as EPOS3. Heavy-flavor particles have been suggested as a good probe to study the properties of the QGP. Heavy quarks (HQ) are produced in the initial hard nucleon-nucleon scatterings and their thermal equilibration time is larger than the QGP lifetime. In this contribution we study the D-meson observables in pPb
collisions at 5 TeV as it offers a complementary perspective with respect to light
hadrons production.

We calculate the nuclear modification factor of D mesons in pPb collisions using the MC@sHQ+EPOS3 model. It couples a Monte Carlo propagation of HQ to the 3+1 dimensional fluid dynamical evolution of the QGP from EPOS3 initial conditions, which combine pQCD calculations of the hard scattering with the
Gribov-Regge theory. HQ that in EPOS3 can be produced during the spacelike cascade, the born process and the partonic shower, interact with plasma partons by either elastic or radiative collisions. The HQ form hadrons via coalescence or fragmentation on the hypersurface of constant temperature T=155 MeV.

The ensuring RpA of D mesons in pPb collisions at 5 TeV is a rather subtle balance between cold nuclear effects, equilibration in the QGP droplet and the hadronization mechanism. In our simulation, it shows a suppression for pT less than 3 GeV/c, while for the pT>3 GeV/c one finds an almost constant behavior. Our results are in good agreement with the existing experimental data.

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Session Classification: Heavy Flavor and Quarkonia Production

Track Classification: Heavy Flavor and Quarkonia Production