

Quarkonium measurements at the LHC with the ALICE detector

Friday, May 27, 2011 10:55 AM (15 minutes)

ALICE detector has excellent performances to study quarkonium production in heavy-ion collisions at the LHC collider [1]. In this new energy regime, charmonium could reveal a privileged probe to study the properties of the high-density strongly interacting system formed in the early stages of high-energy heavy-ion collisions [2].

Bottomonium resonances will be abundantly produced, providing new constraints on theoretical models of quarkonium dissociation in QCD matter [1]. Additionally, ALICE will study quarkonium production in proton-proton collisions in which high particle multiplicity events could lead to the formation of high energy density matter as in heavy ions collisions [3].

In ALICE [4], quarkonium is measured down to $p_T = 0$ via their $\mu^+\mu^-$ decay channels in the ALICE muon spectrometer and via their e^+e^- in the ALICE central barrel. After a short description of the apparatus, the transverse momentum and rapidity distributions of inclusive J/Ψ production cross section in proton-proton collisions at LHC energies will be presented. We will discuss the dependence on charged particle multiplicity of J/Ψ yield in proton-proton collisions at $\sqrt{s} = 7$ TeV.

The number of reconstructed tracklets ($\eta < 1.6$) in the silicon pixel detector is exploited to measure the charged particle density at mid-rapidity. Finally, the analysis of the inclusive J/Ψ production in Pb-Pb collisions at a centre of mass energy of $\sqrt{s_{NN}} = 2.76$ TeV will be described. Preliminary results on the nuclear modification factor (RAA) and the central to peripheral nuclear modification factor (RCP) will be shown.

[1] ALICE collaboration, PPR II, J. Phys. G32, 1295 (2006)

[2] P. Braun-Munzinger and J. Stachel, Phys. Lett. B490, 196 (2000); R.L. Thews, M. Schroedter and J. Rafelski, Phys. Rev. C63, 054905 (2001); A. Andronic et al., Phys. Lett. B571, 36 (2003); L. Grandchamp, R. Rapp and G.E. Brown, Phys. Rev. Lett., 92, 212301 (2004).

[3] K. Werner et al. arXiv:1010.0400v1 (2011); K. Werner et al., Phys. Rev. Lett. 106, 122004 (2011).

[4] ALICE collaboration, J. Instrum. 3, S08002 (2008).

Presenter: MARTINEZ-GARCIA, Gines (Laboratoire de Physique Subatomique et des Technologies Associees)

Session Classification: Heavy flavor and Quarkonia in medium

Track Classification: Heavy flavor and quarkonia production