



Vendredi 10/12/2010, 11:00

Bat 703, p 45, CEA Saclay, Orme des Merisiers

Hugo Pereira

IRFU/SPhN

Heavy Quarkonia production in p+p, d+A and A+A collisions at RHIC

The J/ψ meson and its expected suppression in relativistic heavy ion collisions due to a Debye-like color screening mechanism have long been considered a promising signature for the formation of a quark gluon plasma (QGP), a state of the nuclear matter for which the nucleons are melted and the quark and gluons constitute the relevant degrees of freedom. It has therefore been extensively studied experimentally notably at CERN on the SPS and at RHIC. Additionally, new results will shortly become available from the first p+p and A+A collisions at the LHC. However the situation turns out to be more complex (and richer) than what was initially expected: 1) the J/ψ production mechanism from its parent charm quark pair is still largely uncertain and misunderstood; 2) even in the absence of a QGP, the measured J/ψ yields in nuclei collisions (notably d+A) differ significantly from what can be inferred by simply scaling the p+p measurements, assuming that the charm quark pair production is a hard process; 3) there might be other mechanisms by which a QGP can affect the formation of a J/ψ meson than the aforementioned Debye screening.

Results on the J/ψ production obtained at RHIC, mostly by the PHENIX collaboration, over the past 7 years in p+p, d+A and A+A collisions will be reviewed, with an emphasis on what has been learned so far (and which new questions have been raised) in terms of production mechanism, cold nuclear matter effects, and modifications due to the formation of a QGP.