LHC Seminar

SPEAKER: Andrea Dubla

TITLE: **Probing early time dynamics and magnetic fields with the directed flow of light and heavy-flavour particles in ALICE**

DATE: 17 Dec 2019, 11:00

PLACE: 500/1-001 - Main Auditorium

ABSTRACT

High energy heavy-ion collisions produce an extremely strong magnetic field, which is created at early times in the collision by the passage of the charged spectator protons from the incident nuclei. The strength of the field is estimate to be up to 10^15 Tesla at the initial collision time. This magnetic field, and in particular the rate at which it decays, probe unexplored properties of the quark-gluon plasma (QGP), such as its electric conductivity. In addition, chiral effects such as the chiral magnetic effect are expected to be induced by the strong fields. An observable with direct sensitivity to the magnetic field is the charge dependence of directed flow, v_1, which quantify the emission anisotropy of particles produced in the collision zone relative to the direction of the magnetic field. The magnetic field induces a charge separation in this anisotropy. The charm quark is an ideal candidate to probe the properties of this magnetic field, because its formation time is comparable to the time at which the magnetic field is expected to attain its maximum. In this presentation, the first measurement of the charge-dependent directed flow of charged hadrons and of D0/anti-D0 mesons as a function of pseudorapidity in mid-central Pb-Pb collisions at √sNN = 5.02 TeV at the LHC will be discussed. These new measurements at the LHC, together with those at lower RHIC energies, provide new insights into the effects of the strong electromagnetic field and the early-time dynamics of matter created in non-central heavy-ion collisions.

Organised by: M. Mangano, M. Pepe-Altarelli, G. Unal.....
Refreshments will be served at 10h30