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Di-lepton studies in Pb-Pb collisions with CMS

Catherine Silvestre Tello, Los Alamos National Laboratory

The unprecedented center of mass energies available at the LHC offers unique opportunities for studying the properties of the strongly-interacting QCD matter created in Pb+Pb collisions at extreme temperatures and very low parton momentum fractions. With its high precision, large acceptance for tracking and calorimetry, and a trigger scheme that allows analysis of each minimum bias Pb+Pb event, CMS is fully equipped to measure di-muons in the high multiplicity environment of nucleus-nucleus collisions. Such probes are especially relevant for these studies since they are produced at early times and propagate through the medium, mapping its evolution.

This talk presents the capabilities of the CMS experiment to study di-muons production in Pb+Pb collisions. In particular, we show that CMS has very good detection conditions for the studies of J/ψ and υ productions, with an excellent dimuon mass resolution and a rather good acceptance. The silicon tracking of CMS will allow to identify displaced vertices in order to disentangle primary and secondary J/ψs. CMS will also be able to measure the $Z0$ cross section in heavy-ions collisions, for the first time with the expected first data taking.

The early corresponding p+p measurements will be reviewed as they will serve as baseline for the heavy-ions measurements."