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Study of the neutral mesons in Pb-Pb collisions at $\sqrt{s_{NN}}=2.76$ TeV in the ALICE experiment at LHC

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π^0 and η mesons are probes for studying, among other interesting phenomena, the energy loss of partons traversing the hot and dense medium, the Quark-Gluon Plasma, that is formed in heavy-ions collisions. In addition, the study of π^0 and η mesons in Pb-Pb collisions is necessary for the direct-photon measurement since these mesons constitute its most important background.

The ALICE experiment at the LHC measures neutral meson spectra in Pb-Pb collisions with several complementary methods. One of these is the Photon Conversion Method (PCM), based on the reconstruction of photon conversions by the ALICE Inner Tracking System (ITS) and the Time Projection Chamber (TPC). This method provides a measurement at low p_T , down to 0.4 GeV/c for the π^0 and to 1 GeV/c for the η , with a large significance. It uses e^+e^- pairs from photon conversions in the detector material to obtain a clean photon sample. Neutral mesons are then reconstructed via the two gamma decay channel.

The π^0 has been measured with 2010 data and the results obtained have been published recently. The η was more challenging to measure with the 2010 data as the available statistics was not sufficient to have a significant measurement. On the other hand, the large statistics of the 2011 data allows a measurement of the differential invariant cross section of the η meson as function of transverse momentum up to a p_T of about 10 GeV/c in different centrality classes.

The π^0 measurement from data collected with the ALICE experiment during the 2010 Pb-Pb run and, if possible, the current status of the η meson analysis from data collected during the 2011 Pb-Pb run will be presented.

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