



Contribution ID: 301

Type: Poster

Measurement of neutral pions in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV with the PHOS detector at ALICE

Tuesday, 29 September 2015 16:30 (2 hours)

A state of deconfined quarks and gluons, called quark-gluon plasma (QGP), is created in high-energy heavy-ion collisions.

The ALICE experiment is mainly devoted to the study of heavy-ion collisions produced at the LHC to investigate such the new state of matter.

Neutral mesons such as π^0 and η that decay into two photons are suitable to study parton energy loss in the QGP, since they can be identified, using a fine-segmented electromagnetic calorimeter, in a wide transverse momentum range.

The Photon Spectrometer (PHOS) in the ALICE is an electromagnetic calorimeter, located at 4.6 m from the interaction point, consisted of 10,752 segments with a $2.2 \times 2.2 \times 18$ cm³ PbWO₄ crystal read out by an APD.

This fine granularity allows us to distinguish two photons decayed in a small opening angle from a parent particle at a high transverse momentum.

I am analyzing the Pb-Pb data at $\sqrt{s_{NN}} = 2.76$ TeV recorded in 2011 with an integrated luminosity $100 \mu\text{b}^{-1}$ and detected with centrality triggers.

Clear π^0 peak was extracted in a wide p_T range and each centrality class via di-photon channel with the PHOS detector in ALICE.

I will report the current status of my analysis, namely event selections, acceptances, efficiencies and invariant mass spectra with two photons up to 40 GeV/c.

On behalf of collaboration:

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Session Classification: Poster Session

Track Classification: Jets and High p_T Hadrons