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Measurement of Neutral Mesons and Direct Photons in pp collisions with the ALICE EMCal detector at the LHC

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ALICE has measured the invariant cross sections for the production of π^0 and η mesons in proton-proton collisions at center of mass energies of $\sqrt{s} = 0.9$ TeV, 2.76 TeV, 7 TeV and most recently 8 TeV.

Neutral mesons are reconstructed via their two photon decay channels by means of an invariant mass analysis.

Photons are detected with three different systems; using the central barrel tracking detectors of ALICE in order to reconstruct photon conversions (PCM) and the two available calorimeters in the experiment, namely the Photon Spectrometer (PHOS) and the Electromagnetic Calorimeter (EMCal).

The reported measurements are carried out as well using a 'hybrid' system which reconstructs meson candidates by combining one EMCal photon with one PCM photon.

Thus, this 'hybrid' system serves as an important cross-check for the single measurements and additionally measures an almost independent set of meson candidates.

The EMCal is a sampling calorimeter with good acceptance and high reconstruction efficiency, enabling measurements of π^0 and η mesons up to highest transverse momenta due to its excellent triggering capabilities. In addition to these results on neutral meson production, the corresponding η/π^0 -ratios will be shown to test scaling laws for particle production.

All obtained results will be compared with different Monte Carlo generators as well as recent NLO pQCD predictions.

Based on the obtained results, inclusive direct photon measurements are being carried out, for which the most recent status will be presented.

A novel method using the 'hybrid' PCM-EMCal system is followed in addition to tag π^0 candidates and extract the direct photon signal, which will be shortly illustrated.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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