

Neutral pion and η meson production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

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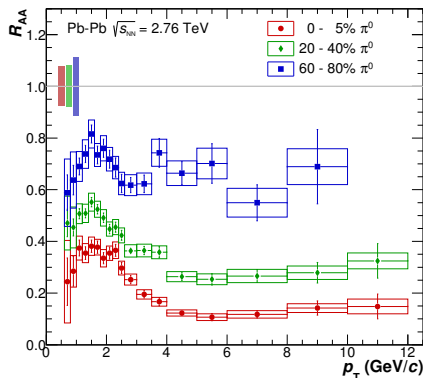
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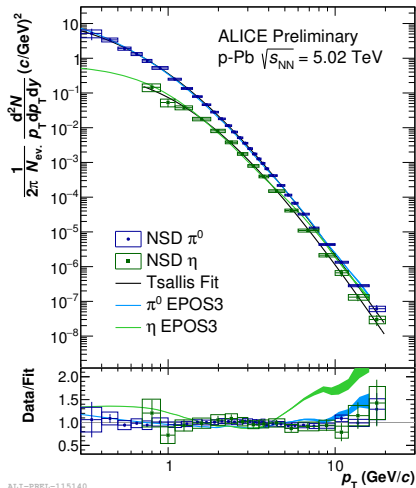
Motivation

The study of neutral meson production in p-Pb collisions is of importance:

- to confirm that the strong suppression observed in central Pb-Pb collisions is a final-state effect of the produced dense medium.
- to constrain theoretical models of particle production, as well as to provide constraints for nPDFs and FF.
- for the extraction of the direct photon spectra, as neutral pion and η mesons are the main source of background for direct photons.



Meson Yields



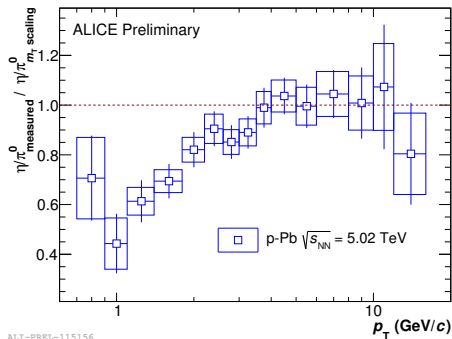
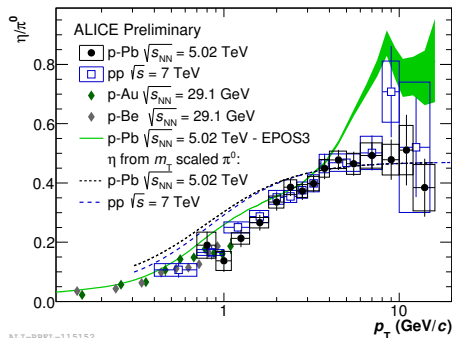
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The combined π^0 and η meson invariant differential yields were obtained by combining the individual meson measurements via a weighted average.

Comparisons to theoretical model calculations show that:

- The EPOS3 event generator reproduces the π^0 inclusive spectrum over the full measured p_T range while for the η spectrum it only reproduces the distribution at $p_T < 4$ GeV/c.

η/π^0 ratio and m_T scaling

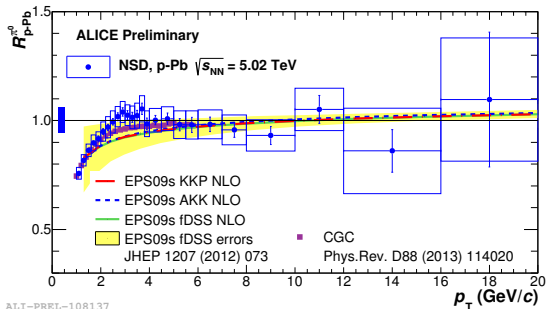


- The plots show that the obtained η/π^0 ratio is constant with a value of 0.47 ± 0.02 at $p_T > 4$ GeV/c.
- At $p_T < 2$ GeV/c, the η/π^0 shows a deviation from the ratio predicted by the m_T scaling.
- Experimental results of p-Au and p-Be agree with this measurement at low p_T . The η/π^0 ratio shows a good agreement with the one of pp at $\sqrt{s} = 7$ TeV measured by ALICE.

Nuclear modification factor

The nuclear modification is defined as:

$$R_{p-Pb}(p_T) = \frac{d^2 N_{ch}^{pPb} / d\eta dp_T}{\langle T_{pPb} \rangle d^2 \sigma_{ch}^{pp} / d\eta dp_T} \quad (1)$$



- The R_{p-Pb} for the π^0 meson agrees with unity at $p_T > 2$ GeV/c.
- pQCD calculations and CGC describe the R_{p-Pb} within the errors.