

Centrality and pseudorapidity dependence of the transverse energy density in pPb collisions at $\sqrt{s(NN)}=5.02$ TeV

By: [Sirunyan, AM](#) (Sirunyan, A. M.)^[1]; [Tumasyan, A](#) (Tumasyan, A.)^[1]; [Adam, W](#) (Adam, W.)^[2]; [Ambroggi, F](#) (Ambroggi, F.)^[2]; [Asilar, E](#) (Asilar, E.)^[2]; [Bergauer, T](#) (Bergauer, T.)^[2]; [Brandstetter, J](#) (Brandstetter, J.)^[2]; [Brondolin, E](#) (Brondolin, E.)^[2]; [Dragicevic, M](#) (Dragicevic, M.)^[2]; [Ero, J](#) (Ero, J.)^[2] ...More

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Abstract

The almost hermetic coverage of the CMS detector is used to measure the distribution of transverse energy, E-T, over 13.2 units of pseudorapidity, η , for pPb collisions at a center-of-mass energy per nucleon pair of $\sqrt{s(NN)} = 5.02$ TeV. The huge angular acceptance exploits the fact that the CASTOR calorimeter at $-6.6 < \eta < -5.2$ is effectively present on both sides of the colliding system because of a switch in the proton-going and lead-going beam directions. This wide acceptance enables the study of correlations between well-separated angular regions and makes the measurement a particularly powerful test of event generators. For minimum bias pPb collisions the maximum value of $dE(T)/d\eta$ is 22 GeV, which implies an E-T per participant nucleon pair comparable to that of peripheral PbPb collisions at $\sqrt{s(NN)} = 2.76$ TeV. The increase of $dE(T)/d\eta$ with centrality is much stronger for the lead-going side than for the proton-going side. The η dependence of $dE(T)/d\eta$ is sensitive to the η range in which the centrality variable is defined. Several modern generators are compared to these results but none is able to capture all aspects of the η and centrality dependence of the data and the correlations observed between different η regions.

Keywords






















KeyWords Plus: PLUS AU COLLISIONS; P-PB COLLISIONS; NUCLEUS COLLISIONS; RAPIDITY LOSS; MULTIPLICITY; COLLECTIVITY

Author Information

Reprint Address: Sirunyan, AM (reprint author)

 Yerevan Phys Inst, Yerevan, Armenia.

Addresses:

-  [1] Yerevan Phys Inst, Yerevan, Armenia
- [2] Inst Hochenergiephys, Vienna, Austria
-  [3] Inst Nucl Problems, Minsk, BELARUS
-  [4] Univ Antwerp, Antwerp, Belgium
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