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Pion Production Cross-section Measurements in p+C Collisions at the CERN SPS for Understanding Extensive Air Showers

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An important approach to studying high-energy cosmic rays is the investigation of the properties of extensive air showers; however, the lateral distribution of particles in simulations of such showers strongly depends on the applied model of low-energy hadronic interactions. It has been shown that many constraints to be applied to these models can be obtained by studying identified-particle spectra from accelerator collisions, in the energy range of the CERN Super Proton Synchrotron.

Here we present measurements of the pion production cross-section obtained by the NA61/SHINE experiment at the SPS, in proton-carbon collisions at the beam energy of 30 GeV from the years: 2007 and 2009. Further analyses of identified-particle yields in SHINE, in particular with a pion beam, are in preparation.

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