

Model predictions of hadron production measurements using proton-carbon interactions at high energies

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Collaboration

Abstract content

The primary interactions of protons and the secondary interactions of protons, Kaons and pions with the target and the beam-line material dominate the uncertainty in the flux of neutrino beams. Hadron production measurements from a comprehensive set of interactions which will allow modern neutrino experiments to make more precise neutrino cross section and oscillation measurements. In this work, comprehensive results on the double differential yield of π^\pm and k^\pm mesons, protons and antiprotons as a function of laboratory momentum are presented. These hadrons are produced in proton-carbon interaction at high energies. EPOS 1.99, EPOS-LHC and QGSJETII-04 models are used to perform simulations. The simulation results of these three models are compared in order to conclude about the best model for the description of the particles produced in primary and secondary interactions at SPS energies. Hadron production measurements are of significant importance for a precise prediction of the neutrino beam used in the neutrino experiment and for the interpretation of Extensive Air Shower (EAS) data.

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