

Hadron Production Measurements from NA61/SHINE at the CERN SPS

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In this talk I will present preliminary results on pion spectra in p+C interactions at 31 GeV/c from a fixed target experiment NA61/SHINE (SHINE= SPS Heavy Ion Neutrino Experiment). The physics program of the NA61/SHINE experiment at CERN consists of three subjects [1,2]. First, measurements of hadron production needed for neutrino (T2K) and cosmic-ray (Pierre Auger and KASCADE) experiments. Second, measurements of hadron production in proton-proton and proton-nucleus interactions as reference data for nucleus-nucleus reactions. Third, most important, measurements of energy dependence of hadron production properties in proton-proton, proton-nucleus, and nucleus-nucleus interactions with the aim to find evidence for the critical point of strongly interacting matter and identify the properties of the onset of deconfinement. In this talk I will focus on the first topic. I will present preliminary results on pion spectra in all inelastic p+C interactions at 31 GeV/c for the T2K experiment at J-PARC [3,4]. Knowledge of pion and kaon production is very important for improving the accuracy of neutrino flux simulations. The NA61 detector consists of four Time Projection Chambers, three Time Of Flight (TOF) detectors, and Projectile Spectator Detector. Forward TOF detector was constructed to fulfill T2K acceptance requirements. The NA61 detector has a large angular acceptance and good particle identification. The performance of the NA61 detector will be discussed. Three different methods of the pion spectra measurement will be presented. Finally, preliminary momentum spectra of charged pions in p+C interactions at 31 GeV/c will be shown. Distributions will be compared with predictions of several Monte Carlo models.

[1] N.Antoniou et al. [NA49-Coll.], CERN SPSC-2006-034, (2006).

[2] N.Antoniou et al. [NA61/SHINE Coll.], CERN SPSC-2007-019, (2007).

[3] T2K Collaboration (Y. Hayato for the coll.), Nucl.Phys.Proc.Suppl.143:269-276,2005.

[4] T2K Collaboration (D. Karlen for the coll.), Nucl.Phys.Proc.Suppl.159:91-96,2006.

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