
Contribution ID: **335** Type: **Poster**

# π+ and π- mutliplicities measured in p+C interactions at 31GeV/c in NA61/SHINE for the T2K experiment.

The T2K (Tokai-to-Kamioka) is a second generation long baseline neutrino oscillation experiment which, for the first time in the world, was able to detect νμ−>νe appearance [1] and as a result the oscillation parameter θ13 could be measured.
The T2K neutrino beam predictions require knowledge of the hadron production in proton-carbon interactions at 31 GeV/c. The NA61/SHINE (SHINE = SPS Heavy Ion and Neutrino Experiment) comes into importance as in the first stage of data taking (2007-2010) it aimed to deliver data needed for the T2K. This experiment is a large acceptance hadron spectrometer located in the North Area H2 beam line of the CERN SPS. The main tracking and particle identification devices are large volume Time Projection Chambers (TPCs) and Time-of-Flight detectors (ToF).
Multiplicities and differential cross sections of charged pions measured with NA61/SHINE data collected during the 2009 run will be presented. The analysis is based on energy loss (dE/dx) measurement in the active volume of the TPCs. The results are presented as a function of laboratory momentum in 11 intervals of the laboratory polar angle covering the range from 0 up to 420~mrad. These spectra are compared with limited in statistics results from the 2007 run [2] as well as with the results obtained on the 2009 data using different analysis techniques.
Measurements for π+ and K+ from 2007 were already used by the T2K experiment to tune neutrino beam simulations and reduce uncertainties [3]. Complementary results from the NA61/SHINE 2009 data analyses with smaller statistical and systematic errors will allow for further reduction of neutrino and antineutrino flux uncertainties in T2K.

References

[1]. K. Abe et al. [T2K Collaboration], Observation of Electron Neutrino Appearance in a Muon Neutrino Beam, Phys.Rev.Lett. 112, 061802 (2014).
[2]. N. Abgrall et al., [NA61/SHINE Collaboration], Measurements of Cross Sections and Charged Pion Spectra in Proton–Carbon Interactions at 31GeV/c, Phys. Rev. C84, 034604, (2011).
[3]. K. Abe et al.[T2K Collaboration], The T2K Neutrino Flux Prediction , Phys.Rev. D87, 012001 (2013).

**Primary author:** Dr POSIADALA, Magdalena (University of Warsaw)

**Presenter:** Dr POSIADALA, Magdalena (University of Warsaw)

**Track Classification:** Neutrino Beam Flux