Contribution ID: **15** Type: **not specified**

Phenomenological study of exclusive binary light particle production from antiproton-proton annihilation at FAIR/PANDA

Wednesday, 17 February 2016 09:40 (25 minutes)

Exclusive binary annihilation reactions induced by antiprotons of momentum from 1.5 to 15 GeV/c can be extensively investigated at FAIR/PANDA [1]. The hadronization process (how a hadron is built from the quantum vacuum created by the pp annihilation and how does it mass, and quantum numbers arise) is the most fundamental problem in QCD. We are specially interested in the channel of charged pion pairs. Whereas this very probable channel constitutes the major background for other processes of interest in the PANDA experiment, it carries unique physical information on the quark content of proton, allowing to test different models (quark counting rules, statistical models,..). However, models as QCD-quark counting rules can not predict absolute cross sections of such exclusive processes. Experimental data are such scarce that no precise and complete angular distributions are available in a large energy range, particularly in the range of PANDA. To study the binary reactions of light meson formation, we are developing an effective Lagrangian model based on Feynman diagrams which takes into account the virtuality of the exchanged particles. Regge factors [2] and form factors are introduced with parameters which may be adjusted on the existing data, which only partially overlap the PANDA energy region. The formalism is built in a suitable way to be easily implemented in an event generator. We will present the first steps of a global analysis of different reactions of antiproton-proton to $\pi 0\ \pi 0$, $\pi +\ \pi -$, $\gamma\gamma$, $\eta\eta$, $\pi 0\ \gamma$, $\eta\ \pi 0$. The final goal is a coherent interpretation of these reactions for reliable predictions of cross sections, energy and angular dependences in the PANDA kinematical range.

Primary author: Ms WANG, Ying (CNRS/IN2P3/Institut de Physique Nucléaire d'Orsay, Université Paris-Sud, France)

Presenter: Ms WANG, Ying (CNRS/IN2P3/Institut de Physique Nucléaire d'Orsay, Université Paris-Sud, France)

Session Classification: Talks