International Conference on Nuclear Physics at

Abstracts book

Table of contents

Abstract ID : 26

Strangeness production on the neutron

Content :

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\documentclass[12pt,a4paper]{article}
\pagestyle{empty}
\begin{document}

\begin{center}
\textbf{\large Strangeness production on the neutron}\\[3ex]
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\end{center}

In order to fully understand strangeness production in
nucleon-nucleon collisions, it is crucial to obtain data with a
neutron beam or target to complement the mass of results that are
already available in the proton-proton sector. Such information is
also important for the modelling of $K^+$ production in $pA$ and
$AA$-induced reactions. The challenge of getting proton-neutron data
is being tackled in two different ways at the ANKE facility of the
COSY-J\"ulich storage ring.

Inclusive momentum spectra of $K^+$ produced at small angles in
proton-proton and proton-deuteron collisions have been measured at
four beam energies, 1.826, 1.920, 2.020, and 2.650~GeV. After making
corrections for Fermi motion and shadowing, the data to be presented
indicate that strangeness production is much weaker in $pn$- than in
$pp$-induced reactions, especially in the near-threshold region.

The precision achievable in a deuteron/proton comparison is very
limited unless the production in $pn$ collisions dominates. The
situation is far cleaner if one carries out $K^+p$ coincidence
studies. Measurements were made in the Spring of $pd \to K^+pX$,
where a slow recoiling proton was detected in one of the silicon
tracking telescopes. This enables the CM energy in quasi-free $pn$
collisions to be determined on an event-by-event basis. Below the
threshold for $\Sigma$ production, only $\Lambda$ production is
possible and these data will allow the total cross sections for the
$pn\to K^+\Lambda n$ reaction to be extracted over a range of excess
energies and to be compared with the well established $pp\to
K^+\Lambda p$ measurements. The conditions of this experiment will be
presented and analysed.

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Track classification :

Contribution type : --not specified--

Submitted by : Prof. WILKIN, Colin

Submitted on Thursday 16 June 2011

Last modified on : Thursday 16 June 2011

Comments :