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Strangeness production on the neutron

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\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 Σ production, only Λ 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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