

## Recent results on the $K\text{-(stop)} + A \rightarrow \Sigma^{\pm} + \pi^{\mp} + A$ reaction with FINUDA

Wednesday, 7 September 2011 15:00 (20 minutes)

on behalf of the FINUDA Collaboration

The presentation deals with the study of the  $K_{stop}^- A \rightarrow \Sigma^{\pm} \pi^{\mp} A'$  reaction, which is studied on light nuclei,  $A = {}^6,7\text{Li}, {}^9\text{Be}, {}^{13}\text{C}$  and  ${}^{16}\text{O}$ . Final  $\Sigma$ 's and  $\pi$ 's are detected by using the FINUDA spectrometer, which operated at the DAΦNE  $e^+e^-$  facility (LNF). The  $\Sigma^{\pm}$  hyperons are reconstructed via the  $n\pi^{\pm}$  decay with the neutrons detected by TOFONE, a large volume plastic scintillator array. The two final  $\pi^{\pm}$  mesons are reconstructed by means of the tracking device of FINUDA, which consists of 5 position sensitive layers. Final  $\Sigma^{\pm}\pi^{\mp}$  pairs are selected by requiring a proper topology for the  $n\pi^{\pm}$  correlated pairs, where the  $n\pi^{\pm}$  pairs are requested to have  $\Sigma^{\pm}$  invariant mass. \\ The  $\Sigma^{\pm}\pi^{\mp}/K_{stop}^-$  emission rates are reported as a function of  $A$ . These rates are discussed in comparison with previous experimental findings \cite{katz} \cite{vander-velde} and with the existing theoretical issues \cite{staronski} \cite{ohnishi}. They are also used to calculate the  $\gamma$  ratio ( $\gamma = \Sigma^+\pi^-/\Sigma^-\pi^+$ ) which strongly increases when the kaon is absorbed on an in-medium proton instead of a free proton. This effect is closely related to the sub-threshold behavior of the  $\bar{K}N$  interaction. \\ The momentum spectra of prompt pions and free sigmas are also discussed as well as the  $\Sigma^{\pm}\pi^{\mp}$  missing mass behavior. These spectra are discussed in detail rather than the invariant masses. In this case, the  $\Sigma^{\pm}\pi^{\mp}$  channel is filled by two resonances  $\Sigma(1385)$  and  $\Lambda(1405)$  as well as by the  $\Sigma^{\pm}\pi^{\mp}$  quasi-free reaction whose phase space develops in the same region as the two resonances \cite{oset}.

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