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Results on the $K^-_{stop}A \to \Sigma^{\pm}\pi^{\mp}A'$ reaction on light nuclei.

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The $K^-_{stop}A \to \Sigma^{\pm}\pi^{\mp}A'$ reaction is studied on light nuclei, $A = {}^{6,7}Li$, ${}^{9}Be$, ${}^{13}C$ and ${}^{16}O$.
The outgoing Σ's and π's are detected 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 FINUDA tracker, which consists of 5 position sensitive layers. Final $\Sigma^{\pm}\pi^{\mp}$ pairs are selected requiring topological cuts 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 compared to previous experimental measurements. They are also used to calculate the γ 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 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.
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.

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