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The FINUDA Experiment: recent results

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Data on kaon induced reactions on nuclei are scarce and old, dating back to more than 40 years ago. They had been collected in bubble chamber experiments, filled with ^{4}He, hydrocarbon mixtures or Neon, or in emulsions, composed mainly by mixtures of elements heavier than Oxygen.

FINUDA could exploit the decay almost at rest of the $\phi(1020)$ mesons produced at the e^+e^- DAΦNE machine to study the interaction of low-energy kaons on several thin targets composed by p-shell nuclei, isotopically pure to a level better than 97\%.

In parallel to hypernuclear spectroscopy and decay investigations,
FINUDA deployed a wide program dedicated to the study of kaon absoption processes, by one or more nucleons, in reactions with the emission of Λ and $\Sigma^{\pm}$ (Y) hyperons. The apparatus, a magnetic spectrometer, allowed the recostruction of the hyperons and the identification of the other emitted charged tracks with a large efficiency and good momentum resolution.

The study of the kaon absorption reactions in nuclei is particularly complex as the recoiling nuclear system cannot be measured, and often, after the interaction, it is left in an unstable state. Therefore missing mass considerations can be helpful only in a fraction of cases.
Dedicated analysis methods, based on models which reproduce by Monte Carlo simulations the elementary absorption reactions and following processes (hyperon conversions and/or final state interactions of nucleons and hyperons, hyperon decays), have been developed to pursue the most complete and precise description as possible of the experimental data.

Results on the interactions at rest of negative kaons on ^{6}Li, ^{7}Li, ^{9}Be, ^{13}C and ^{16}O have been obtained. They are of fundamental importance in the understanding of processes involving the dynamics of strange quarks in nuclei and can give valuable inputs in the attempt to model strange nuclear matter
behavior at low energies.

In this talk a selection of the most recent results achieved by FINUDA in the study of YN pair production will be reported, with a description of the experimental methods for the data selection and the adopted analysis techniques.

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