

# Studying Strange Meson Production with FOPI

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With the FOPI detector, located at the Schwerionensynchrotron SIS of the GSI, a variety of reactions induced by pions (0.8–2.8 GeV/c), protons (up to 4.5 GeV) and heavy ions (up to 2 AGeV for charge/mass=0.5) is studied. The used targets range from liquid hydrogen up to lead. The FOPI detector can measure the charged reaction products in a large part of the solid angle. The production of strangeness has drawn particular interest since in a heavy ion collision strange mesons can only be produced in the high density phase, thus they carry information about the properties of the fireball. Furthermore, the interactions of strange mesons with the surrounding medium deliver information i.a. on the in-medium kaon-nucleon potential.

The talk will discuss selected results obtained in heavy ion collisions on the production of strange mesons ( $K_S^0$ ,  $K^\pm$ ,  $\phi(1020)$ ) near threshold.

Subsequently, results concerning the in-medium cross sections of the reaction  $1.15 \text{ GeV/c } \pi^- + A \rightarrow K_S^0 + X$  are presented comprising an outlook on a measurement with a  $1.7 \text{ GeV/c } \pi^-$  beam, where the production of  $K^+K^-$  pairs can be studied.

Finally, as a contribution to the search for deeply bound antikaonic nuclear states (see e.g. [1]) a measurement of the reaction  $3 \text{ GeV } p + p$  is prepared. If a bound state  $[ppK^-]$  was formed, it should decay into  $\Lambda + p$ . In order to enrich events containing a  $\Lambda$  hyperon, the FOPI detector setup will be supplemented by a  $\Lambda$  trigger. Here, the current status and the results from a test beam will be reported as well.

[1] T. Yamazaki and Y. Akaishi, Phys. Rev. C 76 (2007) 045201

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