Strangeness Production at COSY-11

D. Grzonka for the COSY-11 collaboration

Forschungszentrum Jülich, Institut für Kernphysik, 52425 Jülich

First experimental results of the COSY-11 collaboration concerning total cross sections for pp-induced strangeness production will be presented.
The COSY-11 installation (see Ref. 1) is an internal target experiment at the cooler synchroton COSY, designed for meson production studies close to threshold. A COSY machine dipole is used here as a magnetic separator. In front of the COSY dipole a hydrogen cluster target is installed producing densities of about 10^{14} $atoms/cm^2$ (Ref. 2). The reaction products are separated from the proton beam by the magnetic field. Positively charged particles are detected using a system of drift chambers and scintillators and for negatively charged particles a Si-pad detector is installed in the dipole gap. Although the gap height limits the acceptance in the laboratory system the full acceptance is achieved in the CM system close to threshold.
At COSY-11 threshold measurements for the channels ppK^+K^- and $pp \to pK^+\Lambda$ has been done. For the reaction channel $pp \to ppK^+K^-$ the momentum components of the two protons and the K^+ are reconstructed by tracking back to the target with the measured directions. The particle identification results from an additionally time of flight measurement. For the channel $pp \to pK^+\Lambda$ the analysis is similar. The momenta of the charged ejectiles p and K^+ are reconstructed from which the 4-momentum components of the unobserved Λ particle result.
The resolution of the detection system is sufficient for a clear separation of pions, kaons and protons in the particle identification. In the K^+K^- channnel as well as in the $pK^+\Lambda$ channel the background is very low which allows a clear separation of these events.

1. S. Brauksiepe et al., Nucl. Instr. & Meth. A 376 (1996) 397-410.
2. H. Dombrowski et al., accepted for publication in Nucl. Instr. & Meth.