

Meson Production at COSY-TOF and COSY-ANKE

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Some of the recent results from the meson production programmes at the TOF and ANKE facilities at COSY-Jülich are reviewed. Associated strangeness production has played an important role at both spectrometers and TOF has now produced data which show the delicate interplay of reaction mechanism and final state interaction (FSI) effects in the $pp \rightarrow K^+p\Lambda$ reaction. In addition to Dalitz plot data, the collaboration has extracted information on the angular dependence of the final particles. In contrast to TOF, the ANKE spectrometer has only a limited angular coverage but its excellent K^+ identification allows reactions such as $pp \rightarrow K^+n\Sigma^+$ to be studied reliably near threshold. These measurements show that the total cross section is not dissimilar to that for $pp \rightarrow K^+p\Sigma^0$, for which extra information is also obtained regarding the Σ^0p FSI. K^+ production in quasi-free pn collisions, leading to the formation of the Σ^- hyperon, could also be investigated at ANKE by detecting the spectator proton in reactions on the deuteron.

New data are also available on the production of non-strange mesons in nucleon-nucleon collisions. The tensor polarisation of the ω in the $pp \rightarrow pp\omega$ reaction was investigated at TOF through measurements of the angular distributions of the pions from the $\omega \rightarrow \pi^+\pi^-\pi^0$ decay. ANKE is well suited for the measurement of two final protons with low relative energy ($E_{pp} < 3$ MeV) in $pp \rightarrow \{pp\}X$ and data have been obtained where $X = \gamma, \pi^0, 2\pi, \text{ and } \eta$ and these experiments are now being enhanced through the use of a polarised proton beam. The production in proton-neutron interactions can be studied at ANKE with either a deuteron beam or target and new results will be presented on the cross section for $np \rightarrow d\eta$ near threshold, which are interesting in the light of the still open questions on the possible existence of η -mesic nuclei.

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