$K\bar{K}$ production at COSY

Vera Kleber[(a,b)]
for the ANKE Collaboration

[(a)] Institut für Kernphysik, Universität zu Köln, Germany
[(b)] Institut für Kernphysik, Forschungszentrum Jülich, Germany

Near threshold $K\bar{K}$ production has been studied in several hadronic reactions at COSY in order to study the field of scalar- and ϕ-mesons.

The nature of the scalar resonances $a_0/f_0(980)$ is not yet understood although they have been observed in many experiments. They are interpreted, e.g., as genuine mesons (and thus members of the scalar $q\bar{q}$ nonet), $K\bar{K}$ molecules or compact qq–$\bar{q}\bar{q}$ states.

An experimental program at COSY–Jülich has been started aiming at exclusive data on a_0/f_0 production from pp, pn, pd and dd interactions close to the $K\bar{K}$ threshold. The final goal is the extraction of the charge-symmetry breaking a_0/f_0 mixing amplitude which may help to shed light on the nature of the light scalar resonances.

As a first experiment at ANKE the reaction $pp \to dK^+\bar{K}^0$ was studied. The measurements were performed at beam energies of T_p=2.65 and 2.83 GeV, corresponding to excess energies of 46 and 103 MeV above the $K\bar{K}$ threshold. From the measurement at the lower energy the total cross section of the reaction $pp \to dK^+\bar{K}^0$ as well as differential distributions have been extracted [1]. The main contribution to this reaction is interpreted as $a_0^+ \to K^+\bar{K}^0$ decays. Furthermore, the differential distributions may give information on the $d\bar{K}^0$ FSI and scattering length. The data at the higher energy are still under analysis, and the current status will be presented.

Data on $pp \to ppK^+K^-$ are available at several excess energies. Below the ϕ production threshold the contribution from $a_0/f_0(980)$ is not clear [2]. For energies above threshold ϕ mesons are clearly observed at different excess energies but without indications for $a_0/f_0(980)$. A recent beamtime was devoted to $K\bar{K}$ production in pn reactions. The preliminary analysis reveals a prominent ϕ peak. Possible contributions from $a_0/f_0(980)$ will be investigated.

[1] V. Kleber *et al.*, Phys. Rev. Lett. **91**, 172304 (2003)

[2] C. Quentmeier *et al.*, Phys. Lett. B **515**, 276 (2001)

E-mail: v.kleber@fz-juelich.de