

The Near-Threshold Production of ϕ Mesons in pN Collisions

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The $pp \rightarrow pp\phi$ and $pn \rightarrow d\phi$ reactions have been studied at the Cooler Synchrotron COSY-Jülich, using the internal beam and the ANKE facility. Total cross sections in the pp entrance channel have been determined at three excess energies ϵ in the range of 18.5 – 75.9 MeV. The differential cross section closest to threshold at $\epsilon = 18.5$ MeV exhibits a clear S -wave dominance as well as a noticeable effect due to the proton–proton final state interaction [1]. Taken together with data for $pp\omega$ -production, a significant enhancement of the ϕ/ω ratio of a factor 8 is found compared to predictions based on the Okubo–Zweig–Iizuka rule [2,3]. In case of the pn entrance channel the energy dependence of the cross section up to 80 MeV has been extracted by exploiting the intrinsic momentum of the target neutron using a deuterium target [4]. The preliminary results — together with the ANKE data on $pn \rightarrow d\omega$ production [5] — show a similar enhanced ϕ/ω -production ratio as in the pp case.

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