

Near threshold production of η -mesons in proton neutron collisions at ANKE

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Collaboration

ANKE

Abstract content

The interaction between η mesons and hadrons is an intensively investigated topic. Due to its strength it might lead to the formation of η -mesic nuclei. In order to study the characteristics of this interaction a measurement of the reaction $p + d \rightarrow d + \eta + p_{sp}$ has been performed at the ANKE spectrometer at the COSY accelerator of the Forschungszentrum Juelich. In this context the deuteron serves as an effective neutron target whereas the proton is treated as a spectator particle. The two different beam momenta ($p_1 = 2.09$ GeV/c and $p_2 = 2.25$ GeV/c) in combination with the Fermi motion inside the target deuteron grant access to the determination of total and differential cross sections in an excess energy range from threshold up to $Q = 90$ MeV. While the course of the total cross section, especially near threshold, will allow to compute the scattering length $a_{d\eta}$ of an s-wave final state interaction ansatz, the differential cross sections permit to verify the legitimacy of the s-wave assumption. Furthermore the data taken at higher excess energies enable to examine the role of nucleonic resonances in the production process of η mesons. Recent results will be presented and discussed.

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