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The experimental study of pp eta dynamics with WASA-at-COSY

Content :

In order to investigate the interaction of eta-meson with the nucleons, its production near the kinematical threshold has been studied in proton-proton collisions with the WASA detector at COSY storage ring in Juelich, Germany. The data have been taken at beam energy of 1400 MeV (corresponding to an excess energy $Q = 56$ MeV). The eta-meson was detected via $3\pi^0$ decay in the almost 4π central calorimeter while the two final-state protons were measured in forward direction. The determination of four vectors of both protons and the eta-meson in the final state allowed to derive complete kinematical information of the pp eta-system. The proton-proton elastic scattering was used to determine the luminosity for the experiment. This luminosity is then used to normalize the data. The analysis resulted in 97k $\eta \rightarrow 3\pi^0$ events. The angular distribution of the eta-meson in the center of mass frame is anisotropic and the squared invariant mass distributions for proton-proton and proton-eta show deviations from phase space.

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