

Study of the η meson production with the polarized proton beam

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Collaboration

WASA-at-COSY

Abstract content

The η meson production process was studied via measurements of the analyzing power, A_y for the $\vec{p}p \rightarrow pp\eta$ reaction. The measurement was performed with the WASA-at-COSY detector at excess energies of 15 MeV and 72 MeV. The missing mass and invariant mass techniques were used to identify η meson. The angular distribution of the analyzing power of for the η meson was determined. The result is more than 5 order of magnitude more precise than achieved in previous experiments [1,2]. The result of the studies shows a disagreement between experiment and the predicted theoretical behavior of A_y . The data indicate that at the excess energy of 15 MeV there is no contribution from Sd and Pp partial waves. Thus we prove experimentally for the first time that in the $\vec{p}p \rightarrow pp\eta$ reaction the η meson is produced in a s -wave with respect to the protons at least up to 15 MeV. Whereas at an excess energy of 72 MeV contributions from the Pp wave is significant.

[1] R. Czyzykiewicz et al., Phys. Rev. Lett. 98 (2007) 122003.

[2] F. Balestra et al. Phys. Rev. C 69 (2004) 064003.

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