Contribution ID: **191** Type: **Poster**

Optical-model analysis of the proton elastic scattering on 12C nucleus with resonant part contribution

Thursday 3 July 2025 19:00 (20 minutes)

The fitting of all available experimental data of proton elastic scattering on 12C nucleus with the usage of the optical-model program code OptModel [1,2] was performed: differential cross sections at proton energies from 0.4 to 280 MeV, polarization data at the 6-180 MeV interval and 12C+p reaction total cross sections from 4.5 to 171 MeV. The violation of the scattering matrix unitarity (optical-model plus resonant parts) was less than 15% at separate energy points. It was at the level of the mean errors of the analyzed data. Total cross sections of the reaction are presented in the figure as an example.

1. L.N. Generalov, V.A. Zherebtsov, S.M. Taova // Bull. Russ. Acad. Sci. Phys. 80 (2016) 295.
2. L.N. Generalov, V.A. Zherebtsov, S.M. Selyankina // Bull. Russ. Acad. Sci. Phys. 85 (2021) 1136; L.N. Generalov, V.A. Zherebtsov, S.M. Selyankina // Bull. Russ. Acad. Sci. Phys. 87 (2023) 1918; L.N. Generalov, V.A. Zherebtsov, S.M. Selyankina // Bull. Russ. Acad. Sci. Phys. 87 (2023) 1907; L.N. Generalov, V.A. Zherebtsov, S.M. Selyankina // Bull. Russ. Acad. Sci. Phys. 87 (2023) 1899.

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Session Classification: 9. Poster Session

Track Classification: Section 2. Experimental and theoretical studies of nuclear reactions.