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

Thursday 3 July 2025 19:00 (20 minutes)

Optical-model analysis of all available data of deuteron elastic scattering on 12C nucleus with the usage of the optical-model program code OptModel [1,2].The fitting of the differential cross sections on deuteron energies from 0.45 to 270 MeV and 12C+d reaction total cross sections from 0.43 to 171 MeV was performed. The violation of the scattering matrix unitarity (optical-model plus resonant parts) was less than 14% at separate energy points. It was on the level of the mean errors of analyzed data. There was no an essential difference of the values of the optical potential parameters in comparison with [1] except the value of the Rutherford scattering radius.
The quality of the fitting was improved. Total reaction cross sections are presented in the figure.
1. L.N. Generalov, V.A. Zherebtsov, S.M. Selyankina // Book of abstracts LXXIV Int. Conf. "Nucleus-2024". Dubna. 2024. P. 323.
2. L.N. Generalov, V.A. Zherebtsov. A.V. Morozova et al. // Bull. Russ. Acad. Sci. Phys. 88 (2024) 1825.

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