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SCATTERING OF DEUTERONS ON 10B NUCLEI AT AN ENERGY OF 14.5 MEV

From the analysis of data on the elastic scattering of deuterons on ¹⁰B nuclei at an energy of 14.5 MeV within the framework of the optical model of the nucleus, two sets of optical potentials (sets A1 and A2) necessary for carrying out calculations using the coupled channel method were established. Differential cross sections of elastic and inelastic scattering for the following excited states of the ¹⁰B nucleus: Ex = 0.718 MeV, Jπ = 1⁺; Ex = 2.154 MeV, Jπ = 1⁺ and Ex = 3.587 MeV, Jπ = 2⁺ were analyzed within the coupled channel method using the FRESCO code. The best agreement between the theory and experimental data was provided by the set of optical potentials A1. The deformation parameter β₂ was determined from the condition of the best description of the transition to the 0.718 MeV (1⁺) state. The analysis yielded the following value of the quadrupole deformation parameter β₂ = 0.72±0.1 for an energy of 14.5 MeV, which is consistent with the average value β₂ = 0.67±0.05 established from the analysis of proton, deuteron and helium-3 scattering.

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Section

Nuclear physics (Section 1)

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