MODEL-INDEPENDENT DESCRIPTION OF THE LIGHT NUCLEUS-NUCLEUS ELASTIC SCATTERING AT INTERMEDIATE ENERGIES

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We propose a new approach, based on the evolutionary algorithm, which enables to extract a scattering matrix $S(l)$ as a complex function of angular momentum l directly from the nucleus-nucleus elastic scattering data at intermediate energies without any additional model assumptions implied. Due to the automatic monitoring of the scattering matrix derivatives, the obtained S-matrix for ^{16}O - ^{16}O-scattering at 350 MeV is determined by the modulus and nuclear phase, which are smooth monotonic functions of angular momentum. We show the independence of the final S - matrix shapes of the primary model representations chosen to be the commonly used phenomenological ones.