

Study of fusion cross-section and barrier distribution using realistic nucleus-nucleus potential

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In a trial to remove the discrepancy between the values of the parameters of the real heavy-ion potential extracted from elastic scattering and fusion reaction, a realistic real potential used successfully to fit elastic scattering data is applied to fusion reaction. This potential is parameter free and was derived from density dependent nucleon-nucleon force. Both the fusion excitation function and barrier distribution for the fusion process of deformed-spherical nuclear pairs are calculated using coupled channel technique with realistic heavy-ion potential. Vibrations of the deformed nucleus are treated using CCFULL code while rotational excitations are considered in adiabatic approximation. Different sets of deformation parameters for the deformed nuclei are examined in calculating the fusion observable.