

Fusion dynamics of $^{12}\text{C}+^{12}\text{C}$ reaction: An astrophysical interest within the relativistic mean-field approach

The $^{12}\text{C}+^{12}\text{C}$ fusion reaction holds a great significance in the later phases of stellar evolution. To get involved in this evolution, one must understand the corresponding fusion-fission dynamics and reaction characteristics. In the present analysis, we have studied the fusion cross-section along with the S-factor for this reaction using the well-known M3Y and recently developed R3Y nucleon-nucleon (NN) potential along with the relativistic mean-field densities in double folding approach [1]. The density distributions and the microscopic R3Y NN potential are calculated using the NL3* parameter set. The ℓ -summed Wong formula is employed to investigate the fusion cross-section, with ℓ_{max} -values from the sharp cut-off model. The calculated results are also then compared with experimental data [2, 3]. It is found that the R3Y interaction gives a nice fit to the data. So it would be of interest to study the details of this fusion reaction in a microscopic approach.

References:

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