

Charge Dependency of Strong Nuclear Force via Phase Shift Analysis of Nucleon-Nucleon Potential

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Abstract: Using the most recent phase shift data for pp, nn, and np elastic scattering for different states ($l=0,1,\dots$) in the energy range of 1 MeV to 350 MeV, the charge dependency of the strong nuclear force is investigated. Our results indicate that although the charge independency holds in most of the energy range, such charge independency is broken in the particular energy range of 120 MeV to 200 MeV for all partial wave states considered here.

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Key words: elastic scattering, nuclear force, phase shift, nucleon-nucleon potential

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