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LOW-ENERGY PARAMETERS OF NEUTRON-NEUTRON SCATTERING

The influence of the mass difference between charged and neutral π -mesons on the low-energy parameters of nucleon-nucleon interaction in the 1S_0 spin-singlet state is studied. Using the experimental singlet neutron-proton scattering parameters and the experimental value of neutron-neutron virtual-state energy we obtain the following values for the neutron-neutron scattering length and effective range: $a_m = -16,59(114)$ fm, $r_m = 2,826(86)$ fm. Calculated values of these quantities appear to be in reasonable agreement with the contemporary experimental data.

Keywords: neutron-neutron scattering, neutron-neutron interaction, charge dependence of nuclear forces, effective range parameters, neutron-neutron scattering length.