

**EVALUATION OF THE EFFECTIVE RANGE PARAMETERS AND THE ANALYSIS
OF NEUTRON-PROTON SCATTERING DATA IN THE LOW-ENERGY REGION**

Singlet low-energy parameters of neutron-proton scattering are calculated on the basis of approximating the singlet effective-range function $k \cot \delta_s$ by polynomials with the help of the latest experimental data on phase shifts of np -scattering from the SAID nucleon-nucleon database (data of the GWU group). The obtained values of the singlet low-energy parameters are $a_s = -23.719085 \text{ fm}$, $r_{0s} = 2.625917 \text{ fm}$, $v_{2s} = 0.0008677 \text{ fm}^3$, $v_{3s} = -0.01328 \text{ fm}^5$, $v_{4s} = 0.2370 \text{ fm}^7$. With the obtained values of the low-energy parameters, precise description of singlet phase shift in the energy interval $T \lesssim 10 \text{ MeV}$ is received by using the effective-range expansion. Low-energy neutron-proton scattering parameters for the experimental data from the SAID database differ markedly from the analogous results obtained for data of the Nijmegen group. Obtained effective range parameters corresponding to the experimental data from the SAID database lead to an extremely well description of experimental total cross section of neutron-proton scattering, which is in contrast to the set of the effective range parameters of the Nijmegen group.

Keywords: effective range parameters, singlet low-energy parameters of neutron-proton scattering, np -scattering, scattering phase shifts, $T \lesssim 10 \text{ MeV}$.