

A RELATIVISTIC MODEL
OF THE TWO-NUCLEON
PROBLEM WITH DIRECT INTERACTION

I. V. Simenog, A. I. Turovsky

Bogolyubov Institute for Theoretical Physics,
Nat. Acad. of Sci. of Ukraine
(14b, Metrolohichna Str., Kyiv 03143, Ukraine)

S u m m a r y

The problem of two relativistic nucleons is studied on the base of Dirac equations with direct potential interaction. Second-order equations of the Schrödinger - Breit type are formulated for singlet and triplet spin states. Qualitative analysis of possible discrete and continuum spectra in the singlet state is given. The existence of both normal and abnormal energy spectra depending on the potential parameters is founded for the singlet state in the case of rectangular 'potentials'. A nonzero asymptotics of the scattering phase shift at high energies and the violation of the Levinson theorem are established. The description of singlet S -phase for the total energy interval is obtained for the two-nucleon scattering without introduction of a considerable repulsion in the model with direct interaction.