

ABOUT BINDING CONDITIONS FOR A SYSTEM
OF THREE FERMIONS AND IMPOSSIBILITY
OF EXISTENCE OF A TRINEUTRON

Yu. M. Bidasyuk², I. V. Simenog^{1,2}

¹Bogolyubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(14b, Metrolohichna Str., Kyiv 03143, Ukraine),

²Taras Shevchenko Kyiv National University
(6, Academician Glushkov Prosp., Kyiv 03127, Ukraine)

S u m m a r y

Conditions of the existence of a three-fermion bound state are investigated for the states with nonzero angular momentum $L = 1$ and a wide class of interaction potentials. It is shown that the binding of three fermions with purely attractive potentials or the standard attractive potentials at high distances and a short-range repulsion is impossible if two of the fermions are unbound. Moreover, this system is even farther from a bound state when the parameters of potentials are in agreement with the low-energy two-neutron data. The possibility for a bound state of a three-fermion system with $L = 1$ without bound subsystems to exist is demonstrated for the potentials with two attractive regimes. But there exists no bound trineutron for the realistic neutron-neutron interaction even with two regimes of attractions, in contrast to a tetra-neutron considered in [9].