

# Long-range multiparticle interactions induced by neutrino exchange in neutron star matter

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Forces with a large radius of interaction can have a significant impact on the equation of state of matter. Low-mass neutrinos generate a long-range potential due to the exchange of neutrino pairs. We discuss a possible relationship between the neutrino masses, which determine the interaction radius of the neutrino-pair exchange potential, and the equation of state of neutron matter. Contrary to previous statements, the thermodynamic potential, when decomposed into the number of neutrino interactions, vanishes in any decomposition order, except for the interaction of two neutrons. In the one-loop approximation, long-range multiparticle neutrino interactions are stable in the infrared region for all neutrino masses and do not affect the equation of state of neutron matter or the stability of neutron stars. JETP Letters, Vol. 117, No. 2, pp. 98–101 (2023) [http://jetpletters.ru/ps/2407/article\\_35504.shtml](http://jetpletters.ru/ps/2407/article_35504.shtml)

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