

## Degeneracy Enhancement of Neutron-Antineutron Oscillation in Neutron Star

*Saturday, 19 April 2025 11:00 (30 minutes)*

We explore the fermion oscillation in a degenerate environment. The direct consequence is introducing a Pauli blocking factor  $1-f_i$ , where  $f_i$  is the phase space distribution function, for each intermediate mass eigenstate during propagation. It is then much easier for a state with larger existing fraction or density to oscillate into other states with less degeneracy while the reversed process is not enhanced. This can significantly modify the oscillation behaviors. We apply this degenerate fermion oscillation to a concrete scenario of neutron-antineutron oscillation in neutron star. It turns out antineutrons receive a standing fraction to annihilate with the environmental neutrons. The subsequent neutron star heating can put an extremely stringent bound on the baryon number violating cross mass term between neutron and antineutron.

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