

Neutron-mirror-neutron oscillation and neutron star cooling

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In the dense environment of neutron stars (NSs), neutrons n can transit into mirror neutrons n' , which exist in some mirror models. Such a transition leads to exotic energy loss of NSs via emission of photons, which sets limit on the $n - n'$ mixing parameter $\delta_{nn'}$.

lessim 10^{-17} eV. We point out that the beta decay of mirror neutrons and the subsequent formation of clouds of mirror electrons and deuterons inside the NSs will rob energy from the normal sector via $e - e'$ scattering. Given a wide range of milli-charge parameter ϵ , the energy loss of NSs will be dominated by the emission of mirror photons γ' . Then the stringent bounds of NSs on $n - n'$ transition could be relaxed.

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