

Abstract Submitted
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New cold matter effects in neutrino oscillations experiments¹

MIHAI HOROI, ADAM ZETTEL, Central Michigan University — Recently (arXiv:180306332) we showed that the electron density in cold matter exhibits large spikes close to the atomic nuclei sites. We showed that these spikes in the electron densities, 3-4 orders of magnitude larger than those inside the Sun's core, have no effect on the neutrino emission and absorption probabilities or on the neutrinoless double beta decay probability. However, it was not clear if the effect of these density spikes is consistent with an average constant electron density in condensed matter. We now investigated these effects by a direct integration of the coupled equation of motion describing the propagation of neutrinos through cold matter, and we found significant differences between the two approaches for a baseline similar to that from Fermilab to Gran Sasso. These results will be reported, including the effects of cold matter electron densities on the evolution of the mixing amplitudes for the vacuum mass eigenstates.

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