

Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Implications of helicity modifications of primordial neutrinos on their detection¹ JEN-CHIEH PENG, GORDON BAYM, University of Illinois at Urbana-Champaign — Detection of relic neutrinos from the Big Bang, e.g., through the inverse tritium beta decay reaction (ITBD) in the PTOLEMY experiment, remains a major challenge. While the ITBD rate is insensitive to the helicity of Majorana neutrinos, helicity flips of Dirac neutrinos both via interactions with gravitational perturbations and cosmic and galactic magnetic fields does effect the ITBD detection rate for neutrino masses below² $\sim 10^{-2}$ eV. However, resolving relic neutrino events from the tritium beta decay background becomes increasingly difficult with lower neutrino mass, and will require advances in electron detection techniques. We also discuss the prospect of detecting the ITBD reaction for the first time using an intense ^{51}Cr neutrino source.

¹Supported in part by NSF Grant PHY18-22502.

²G. Baym and J.-C. Peng, arXiv:2012.12421 [hep-ph].

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Date submitted: 07 Jan 2021

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