

Abstract Submitted
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Calculations of liquid helium and neon VUV emission spectra, self-absorption and scattering for a neutrino detector I.M. SAVUKOV, Princeton University — To evaluate the feasibility of the recently proposed detection scheme of low energy neutrinos released from the Sun and supernovae called CLEAN, Cryogenic Low Energy Astrophysics with Noble Gases, which relies on the transparency of the noble-gas liquids to VUV radiation produced by neutrinos, we analyze theoretically VUV emission, self-absorption, and scattering of liquid helium and neon, primary candidates for CLEAN. Owing to strong repulsion of noble-gas atoms in the ground state at the equilibrium distance of the relevant excited state, the emission spectrum is substantially shifted from the absorption spectrum, and in principle the absorption is expected very small, allowing building large detectors. Our analysis, however, shows that the self-absorption and Rayleigh scattering are comparable to the size of the proposed detector.

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