

Abstract Submitted
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Nuclear recoil energy spectrum of finite-sized dark matter ANF-FANY CHEN, Univ of British Columbia, TEXONO-CDEX TEAM — Research has shown that direct dark matter detection experiments can distinguish between pointlike and finite-sized dark-matter candidates, both of which are of theoretical interests. In particular, there is an additional form factor in the typical cross section of finite-sized dark matter, causing the nuclear recoil energy spectrum of finite-sized dark matter to decrease more rapidly with the recoil energy than that of pointlike dark matter. Since the spectrum of finite-sized dark matter peaks below 1 keV, which is the common experimental threshold, and falls off rapidly at higher energies, detector with sub-keV threshold is necessary. The current goal of TEXONO-CDEX research program, on the studies of low energy neutrino and dark matter physics at Kuo-Sheng Reactor Neutrino Laboratory and China Jin-Ping Underground Laboratory, is to open the sub-keV detector window with germanium detectors. This work derives a model-independent, theoretical prediction of the nuclear recoil energy spectrum of finite-sized dark matter and is working toward using the predicted spectrum to analyze the experimental data of TEXONO-CDEX, in hope to substantiate or rule out dark matter candidates.

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