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Withdrawn Exploring Multi-scatter Signatures in Dark Matter Searches (G)

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Extensive effort in the hunt for particle dark matter continues to explore WIMP-nucleon cross sections for the typical weak-scale masses below $10^5 \text{ GeV}/c^2$. Extension of the canonical WIMP exclusion limit to superheavy masses becomes an inaccurate description when the cross section rises high enough for relic particles to scatter multiple times within the depth of a detector. These multi-scatter events are cut in traditional WIMP searches, where the weak cross section makes negligible the probability of multiple interactions. Current low threshold dark matter searches with sufficient position resolution can explore new parameter space pushing towards Planck-scale masses, by examining multi-scatter events. Motivation and sensitivity in this region, in the context of the PICO dark matter program, will be presented.

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