

宇宙线加速的非弹性暗物质的直接探测

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A dark matter with a large mass splitting can evade traditional virialized DM direct detection.

In this study, we connect the concept of cosmic-ray accelerated DM in our Milky Way and the direct detection of inelastic scattering in underground detectors to explore spectra that result from several interaction types of the inelastic DM. We find that the mass splitting $\delta < O(1 \text{ GeV})$ can still be reachable for cosmic ray accelerated DM with mass range $1 \text{ MeV} < m_{\chi 1} < 100 \text{ GeV}$ and sub-GeV light mediator using the latest PandaX-4T data, even though we conservatively use the astrophysical parameter (effective length) $\text{Deff} = 1 \text{ kpc}$.

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