

Phenomenology 2025 Symposium



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First High-Throughput Search for Dark Matter Detector Materials

Monday 19 May 2025 17:30 (15 minutes)

We perform the first high-throughput search for materials that can serve as excellent low-mass dark matter detectors. Using properties of over one thousand materials from the *Materials Project* database, we project the sensitivity in dark matter parameter space for experiments constructed from each material, including both absorption and scattering processes between dark matter and electrons. Using the anisotropic materials in the dataset, we further compute the daily modulation rate of known materials, which highlight materials with prospects to detect a directional dark matter wind. Our methods provide the basic tools for data-driven design of dark matter detectors, and our findings lay the groundwork for the next generation of highly optimized direct searches for dark matter as light as the keV scale.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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