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Searching for Ultra-Heavy Dark Matter

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Observational bounds on the mass of dark matter could allow the dark matter to be as heavy as 10^{48} GeV. Such ultra-heavy dark matter candidates emerge as composite objects produced as a result of significant self-interactions in the dark sector. Detection of this kind of dark matter raises new challenges —the low number density of these particles requires detectors with a large target volume, while the transit of an individual ultra-heavy dark matter particle can lead to significant energy deposition. Leveraging the fact that the transit speed of dark matter is $\sim$220 km/s, well below relativistic speeds but above terrestrial speeds, we discuss methods to search for ultra-heavy dark matter.

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