## Phenomenology 2018 Symposium



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## **Self-Destructing Dark Matter**

Tuesday 8 May 2018 17:00 (15 minutes)

We present Self-Destructing Dark Matter (SDDM), a new class of dark matter models which are detectable in large neutrino detectors. In this class of models, a component of dark matter can transition from a longlived state to a short-lived one by scattering off of a nucleus or an electron in the Earth. The short-lived state then decays to Standard Model particles, generating a dark matter signal with a visible energy of order the dark matter mass rather than just its recoil. This leads to striking signals in large detectors with high energy thresholds. We present a few examples of models which exhibit self destruction, all inspired by bound state dynamics in the Standard Model. The models under consideration exhibit a rich phenomenology, possibly featuring events with one, two, or even three lepton pairs, each with a fixed invariant mass and a fixed energy, as well as non-trivial directional distributions. This motivates dedicated searches for dark matter in large underground detectors such as Super-K, Borexino, SNO+, and DUNE.

## **Summary**

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