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Paleo-detectors for Dark Matter II: Read out and sensitivity projections

Monday 6 May 2019 18:00 (15 minutes)

Recently, we proposed paleo-detectors as a method for the direct detection of Weakly Interacting Massive Particle (WIMP) dark matter. Instead of searching for DM induced nuclear recoils in a real-time laboratory experiment, we propose to search for the traces of DM interactions recorded in ancient minerals over geological time-scales. The large integration times of paleo-detectors would allow to obtain exposures much larger than what is feasible in conventional direct detection experiments even for comparatively small target masses. In this talk, we discuss options for the reconstruction of the WIMP (and background) induced damage features in paleo-detectors. Then we present projections for the sensitivity of paleo-detectors to WIMP-nucleon interactions. Further, we show the potential of paleo-detectors to reconstruct the WIMP parameters in the hypothetical case of a discovery.

Summary

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