Abstract Submitted
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Galactic halo model selection using Bayesian inference under directional dark matter detection[1] LOUISA RUIXUE HUANG, JAMES BATTAT, Wellesley Coll — Directional detection is a promising way to detect a potential dark matter candidate, Weakly Interacting Massive Particles (WIMPs). It does not only allow us to distinguish WIMP signals from potential backgrounds with only a small number of events, but also constrain the WIMP velocity distribution in the galaxy. Furthermore, by comparing the Bayesian evidence values resulting from applying different models to the same data, we are able to discriminate between different models of dark matter velocity distribution. We study the ability of directional detectors with different angular resolutions to distinguish between the truncated Standard Halo Model and the triaxial model. We find that with even modest angular resolution, a directional detector with 3D tracking and vector recoil sensitivity could correctly identify a triaxial halo with $\mathcal{O}(\ni\bigtriangledown\prime)$ events.

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