Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Ultra light axions - new observable signatures and theoretical approaches[1] DANIEL GRIN, Haverford College, TRISTAN SMITH, Swarthmore College, DAVID MARSH, University of Gottingen, RENEE HLOZEK, University of Toronto, TAYLOR COOKMEYER, University of California, Berkeley, GERRIT FARREN, Haverford College — Ultralight axions (ULAs) are a well-motivated dark matter candidate, with well-known experimental signatures on CMB temperature and polarization anisotropies. In this presentation, we explore a number of signatures of ULAs on CMB secondary anistropies (weak lensing of the CMB and the kinetic-Sunyaev Zel'dovich effects), establishing the utility of future CMB experimental, galaxy clustering, and galaxy cluster detection efforts to systematically probe ULA parameter space. We also explore the limits of existing computational methods (based on fluid approximations), and the applicability/utility of novel approaches, like Principal Component Analysis (PCA) with the generalized dark matter (GDM) formalism.

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Date submitted: 09 Jan 2020   Electronic form version 1.4