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**Growth of structure in a Universe with complex scalar-field dark matter** TANJA RINDLER-DALLER, University of Michigan, BOHUA LI, PAUL SHAPIRO, University of Texas at Austin — The nature and distribution of dark matter (DM) in the Universe determine the properties of the structures we observe. In recent years, the exploration of different DM candidates has seen a tremendous rise, partly due to the fact that the canonical DM paradigm of a weakly-interacting massive particle (WIMP), has not yet been confirmed experimentally. Moreover, numerical simulations of structure formation of collisonless WIMP DM are often in contradiction with observations of galaxies on small scales. We will assume that ultra-light, self-interacting bosons are responsible for all of the DM. Owing to their ability to form a Bose-Einstein condensate in the very early Universe, DM can be described as a classical complex scalar field (SFDM). In a previous work, we have established that the background evolution of SFDM with a cosmological constant (LSFDM) is in accordance with the concordance LCDM model if the model parameters are properly constrained by observations of the CMB and BBN. However, not only does LSFDM lead to non-standard expansion histories prior to BBN, it can also help to resolve the problems found in the LCDM model on small scales. In this talk, we will present new results on the linear and nonlinear growth of structure in this LSFDM model, and their implications.

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