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Tanja Rindler-Daller (U of Vienna): Growth of perturbations in a Universe with complex scalar-field dark matter

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There is great interest in scalar-field dark matter (SFDM) comprised of ultralight bosons, in which structure formation is supposed to be like standard CDM on large scales but suppressed on small scales by quantum effects. We study the case of complex SFDM, with a global $U(1)$ -symmetry, for which the comoving boson number density is conserved after reheating when SFDM emerged. In addition, we include a repulsive boson self-interaction. In this scenario, SFDM can dominate the Universe before BBN, enhancing the expansion rate before and during radiation-domination, compared to LCDM. We will present our results on the growth of perturbations in such modified cosmology, with implications for the allowed parameter space of complex SFDM models.

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