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PyUltraLight 2: Simulating Interactions Between Ultra-Light Dark Matter and Massive Particles

Wednesday, 29 September 2021 16:20 (15 minutes)

I will discuss simulations of massive objects interacting with ULDM, using an extension of the PyUltraLight code. Simulations of a point mass moving in a uniform background and a SMBH moving within a ULDM soliton broadly confirm simple estimates of dynamical friction timescales. However, in addition to generating complex inhomogeneities, SMBH-ULDM interactions excite coherent “breathing modes” in the soliton. The resulting stochastic dynamics increases the complexity of SMBH-ULDM interactions and is likely to have implications for SMBH merger rates in a ULDM-dominated universe.

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