Relaxion Dark Matter Detection via Atomic Physics

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The cosmological relaxion particle can address simultaneously two important problems in particle physics: the hierarchy problem related to the Higgs mass, and the dark matter problem. Due to its scalar couplings to matter, the coherent oscillations of the relaxion induce variation of the fundamental constants of nature, and can be probed using table-top atomic physics experiments. In our work [1], we postulate that relaxions can form compact objects in the galaxy, which enhance the local density of dark matter and enhance detection prospects. I will describe the current and near-future reach of such experimental tests of relaxion dark matter. Atomic physics experiments can already probe solutions to fundamental particle physics and astrophysics problems at present, and will do so with much higher sensitivity in the near future.

[1] A. Banerjee, D. Budker, J. Eby, H. Kim, and G. Perez, *Relaxion Stars and their detection via Atomic Physics*. arXiv: 1902.08212