Abstract Submitted
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Ultralight dark matter signatures in precision measurements[1] ANDREI DEREVIANKO, University of Nevada, Reno — Virialized Ultra-Light Fields (VULFs) while being viable cold dark matter candidates can in a certain parameter space also solve the standard model hierarchy problem. Direct searches for VULFs due to their non-particle nature require low-energy precision measurement tools. While the previous proposals have focused on detecting coherent oscillations of the measured signals at the VULF Compton frequencies, here we exploit the fact that VULFs are essentially dark matter *waves* and as such they carry both temporal and spatial phase information. Thereby the discovery reach can be improved by using distributed networks of precision measurement tools. We find the expected dark-matter signal by deriving the spatio-temporal two-point VULF correlation function. Based on the developed understanding of coherence properties of dark-matter fields, we propose several experiments for dark matter wave detection. In the most basic version, the modifications to already running experiments are minor and only require GPS-assisted time-stamping of data. We also derive the expected dark matter line profile for individual detectors.

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