

Abstract Submitted
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Plans and prospects for a multiplexed optical lattice clock SHIMON KOLKOWITZ, University of Wisconsin-Madison — We will present a novel design for a multiplexed optical lattice clock. In contrast to other optical lattice clock configurations, this apparatus will allow for independent loading, preparation, and interrogation of two ensembles of strontium atoms in spatially separated, movable optical lattices. Simultaneous differential measurements of the two ensembles will offer common mode noise rejection of shared environmental perturbations and clock laser noise. We will propose new tests of relativity and methods for evaluating clock systematics using differential measurements, and discuss applications of a multiplexed optical lattice clock to gravitational wave detection and searches for beyond standard model physics. Finally, we will briefly discuss the prospects for harnessing the multiplexed optical lattice clock to develop quantum enhanced clocks and clock networks using Rydberg interactions.

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