

Abstract Submitted
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A “Nearly-Lightless” Laser KEVIN COX, JUSTIN BOHNET, JOSHUA WEINER, MATTHEW NORCIA, ZILONG CHEN, JAMES THOMPSON, JILA, University of Colorado at Boulder — Bad-cavity (superradiant) lasers using highly forbidden atomic transitions are predicted to achieve coherence lengths on the order of the earth-sun distance, potentially improving optical atomic clocks and other precision measurements. We have realized a proof-of-principle cold-atom Raman laser operating deep into the superradiant regime, where the atomic linewidth is much narrower than the cavity linewidth. Here we present experiments using a superradiant laser including active and passive sensing of external fields, laser stability to external perturbations, and studies of phase synchronization between two sub-ensembles.

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