

Abstract Submitted
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Quantum Synchronization of three-level atoms¹ PEIRU HE, ANA MARIA REY, MURRAY HOLLAND, University of Colorado Boulder, JILA, NIST — Recent studies show that quantum synchronization, the spontaneous alignment of the quantum phase between different oscillators, can be used to build superradiant lasers with ultranarrow linewidth. We theoretically investigate the effect of quantum synchronization on many coupled three-level atoms where there are richer phase diagrams than the standard two-level system. This three-level model allows two-color ultranarrow coherent light to be produced where more than one phase must be simultaneously synchronized. Of particular interest, we study the V-type geometry that is relevant to current ^{87}Sr experiments in JILA. As well as the synchronization phenomenon, we explore other quantum effects such as photon correlations and squeezing.

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