

Abstract Submitted
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Superradiant emission from a cascade atomic ensemble by positive-P phase space method simulation¹ HSIANG-HUA JEN, National Tsing Hua University — We numerically simulate the superradiant emission properties from an atomic ensemble with cascade level configuration. The correlated spontaneous emissions (signal then idler fields) are initiated by quantum fluctuations of the ensemble. We apply the positive-P phase space method to investigate the dynamics of the atoms and counter-propagating emissions in the four-wave mixing condition. The light field intensities are calculated, and the signal-idler correlation function is studied for different optical depths of the atomic ensemble. Shorter correlation time scale for a denser atomic ensemble implies a broader spectral window required to store or retrieve the idler pulse.

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