

Coherently Driven Micromaser Pumped by Atoms in Superposition States

F. Casagrande, A. Lulli, and V. Santagostino

INFM-Dipartimento di Fisica, Università di Milano, Via Celoria 16, 20133 Milano, Italy

Reprint requests to Prof. F. C.; Fax: +39 02 58357272; E-mail: federico.casagrande@mi.infn.it

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By a Monte Carlo wave function approach we describe the dynamics of a coherently driven micromaser pumped by coherently prepared atoms. The system can exhibit nonclassical effects such as quadrature squeezing, sub-Poissonian photonstatistics, and Rabi oscillations revival. The interplay between driving field and polarised atoms allows manipulating both the photon number and the phase of the cavity field. By varying either the atomic transit time or the injected field intensity, the coherence of the system dynamics can be enhanced or even suppressed, whereas the induced cavity field phase can be shifted.

Key words: Micromaser; Nonclassical Field States; Quantum Trajectories.