

Turkish Journal of Physics

Turkish Journal

of

Physics


Two-level atom in a squeezed vacuum

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Abstract: The master equation for a two-level atom interacting with a strong coherent field and damped into a reservoir formed by a finite bandwidth squeezed vacuum is derived. The master equation extends the Yeoman and Barnett approach to a non-zero detuning of the driving field from the atomic resonance and allows to discuss the role of squeezing bandwidth and the detuning in the level shifts, widths and intensities of spectral lines. The approach is valid for arbitrary values of the Rabi frequency and detuning but for the squeezing bandwidths larger than the natural linewidth in order to satisfy the Markov approximation.

Turk. J. Phys., **23**, (1999), 861-868.

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Other articles published in the same issue: [Turk. J. Phys.,vol.23.iss.5.](#)