ERRATA

Erratum: Resonance fluorescence of a two-level atom in a strong bichromatic field [Phys. Rev. A 41, 6013 (1990)]

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There is an error in this paper in the calculation of the transition dipole matrix elements between different dressed-state manifolds, Eq. (23). In fact, two (rather than one) distinct types of transitions occur, exemplified by transitions from $|m\rangle_{2N}$ to $|m'\rangle_{2N+1}$ and from $|m\rangle_{2N-1}$ to $|m'\rangle_{2N}$. The transition moments for these are

$$ {}_{2N+1}\langle m'|\mu|m\rangle_{2N} = \tfrac{1}{2}\mu\left[\delta_{mm'} + (-1)^m J_{m-m'}\left[-\frac{4\Delta}{\delta}\right]\right] $$

and

$$ {}_{2N}\langle m'|\mu|m\rangle_{2N-1} = \tfrac{1}{2}\mu\left[\delta_{mm'} - (-1)^m J_{m-m'}\left[-\frac{4\Delta}{\delta}\right]\right] . $$

When this correction is incorporated into the calculations, we find four (instead of two) coupled, distinct groups of density matrix elements contributing to each of the central components and the even and odd sidebands. The following changes occur in the results:

(1) The populations of the atomic levels are found to be

$$ \Pi_{\substack{a\\b}}(t) = \frac{1}{2}\left[(1\pm Q) \pm \left\{J_0\left[-\frac{4\Delta}{\delta}\right] - Q\right\}\exp\left\{-\frac{\Gamma_0}{4}\left[3 + J_0\left[-\frac{8\Delta}{\delta}\right]\right]t\right\}\right] , $$

where

$$ Q = 4J_0\left[-\frac{4\Delta}{\delta}\right] \Big/ \left[3 + J_0\left[-\frac{8\Delta}{\delta}\right]\right] . $$

(2) A factor of $\frac{1}{2}\Gamma_0$ is added to the width of every line in the spectrum, so that these become

$$ \Gamma_{\substack{\text{even}\\\text{odd}}} = \tfrac{1}{4}\Gamma_0\left[3 \mp J_0\left[-\frac{8\Delta}{\delta}\right]\right] , $$

with the two components at the central frequency having widths $\frac{1}{2}\Gamma_0$ and Γ_{even}.

(3) The integrated intensities of the sidebands are unchanged while the central components (with widths $\frac{1}{2}\Gamma_0$ and Γ_{even}) have intensities $\frac{1}{4}[1 + QJ_0(-4\Delta/\delta)]$ and $\frac{1}{4}[J_0^2(-4\Delta/\delta) + QJ_0(-4\Delta/\delta)]$, respectively.

Detailed calculations are available upon request.

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