Erratum: Superradiant phase in field-matter interactions [Phys. Rev. A 84, 013819 (2011)]

O. Castaños, E. Nahmad-Achar, R. López-Peña, and J. G. Hirsch

(Received 11 October 2011; published 20 October 2011)

DOI: 10.1103/PhysRevA.84.049901 PACS number(s): 42.50.Ct, 03.65.Fd, 64.70.Tg, 99.10.Cd

Table I contains errors in three rows. The following table corrects these, and includes an extra row (the last) for the analytical expression of $(\Delta\,\hat{\Lambda})^2$. None of the results and conclusions of the paper are affected.

TABLE I. Expectation values and fluctuations of matter and field observables for the coherent and symmetry-adapted states in the superradiant regime. The mean-field behavior obtained in the normal region can be recovered by taking the limit $x \to 1$.

	Coherent	Symmetry-adapted
$\langle\hat{q}\rangle$	$-\sqrt{2N}\,\gamma_c\,x\,\sqrt{1-x^{-4}}$	0
$\langle\hat{p}\rangle$	0	0
$\langle\hat{J}_x\rangle$	$\frac{N}{2}\,\sqrt{1-x^{-4}}$	0
$\langle\hat{J}_y\rangle$	0	0
$\langle\hat{J}_z\rangle$	$-\frac{N}{2}\,x^{-2}$	$-\frac{N}{2}\,x^2\left(1-\frac{1-x^{-4}}{1\pm F}\right)$
$\langle\hat{a}^\dagger\hat{a}\rangle$	$N\,\gamma_c^2\,x^2\,(1-x^{-4})$	$N\,\gamma_c^2\,x^2\,(1-x^{-4})\left(\frac{1\mp F}{1\pm F}\right)$
$\langle\hat{\Lambda}\rangle$	$\frac{N}{2}\left[1-x^{-2}+2\,\gamma_c^2\,x^2\,(1-x^{-4})\right]$	$\frac{N}{2}\left(\frac{1-x^{-2}}{1\pm F}\right)\left\{1+2\gamma_c^2(1+x^2)\mp\left[x^2+2\gamma_c^2(1+x^2)\right]F\right\}$
$\mathbf{(\Delta\hat{q})^2}$	$\frac{1}{2}$	$\frac{1}{2}+2N\,\gamma_c^2\,x^2\left(\frac{1-x^{-4}}{1\pm F}\right)$
$(\Delta\hat{p})^2$	$\frac{1}{2}$	$\frac{1}{2}\mp 2N\,\gamma_c^2\,x^2\left(\frac{1-x^{-4}}{1\pm F}\right)F$
$\mathbf{(\Delta\hat{J}_x)^2}$	$\frac{N}{4}\,x^{-4}$	$\frac{N}{4}\left(1+\frac{(N-1)(1-x^{-4})}{1\pm F}\right)$
$(\Delta\hat{J}_y)^2$	$\frac{N}{4}$	$\frac{N}{4}\left(1\pm\frac{(N-1)(1-x^4)F}{1\pm F}\right)$
$(\Delta\hat{J}_z)^2$	$\frac{N}{4}\,(1-x^{-4})$	$\frac{N}{4}\,\frac{(1-x^{-4})}{(1\pm F)^2}\,[1\mp(N-1)(1-x^4)\,F-x^4F^2]$
$(\Delta\,\hat{a}^\dagger\hat{a})^2$	$N\,\gamma_c^2\,x^2\,(1-x^{-4})$	$\frac{N\,\gamma_c^2\,x^2\,(1-x^{-4})}{1\pm F}\left[1\mp F\pm 4\,N\,\gamma_c^2\,x^2\,(1-x^{-4})\frac{F}{1\pm F}\right]$
$\langle\hat{J}_z\,\hat{a}^\dagger\hat{a}\rangle$	$-\frac{N^2}{2}\,\gamma_c^2\,(1-x^{-4})$	$-\frac{N^2}{2}\,\gamma_c^2\,x^4(1-x^{-4})\left(\frac{x^{-4}\mp F}{1\pm F}\right)$
$\langle\hat{J}_x\,\hat{q}\rangle$	$-\sqrt{\frac{N^3}{2}}\,\gamma_c\,x\,(1-x^{-4})$	$-\sqrt{\frac{N^3}{2}}\,\gamma_c\,x\,\frac{1-x^{-4}}{1\pm F}$
$(\Delta\,\hat{\Lambda})^2$	$\frac{N(1-x^{-4})}{4}\,\left(1+4\,\gamma_c^2\,x^2\right)$	$\frac{N\,(1-x^{-4})}{4\,(1\pm F)^2}\Big[1+4\,x^2\,\gamma_c^2\pm F\,(1-x^4)\Big[1-N\,\left(1+4\,\gamma_c^2\right)^2\Big]$ $-x^2\,F^2\left(x^2+4\,\gamma_c^2\right)\Big]$

