

Erratum: Higgs and Nambu-Goldstone modes in a spin-1 XY model with long-range interactions **[Phys. Rev. A **113**, 053325 (2026)]**

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In our paper, the approximate expressions for the coefficients $u_{A,\mathbf{k}}$, $v_{A,\mathbf{k}}$, $u_{\Phi,\mathbf{k}}$, and $v_{\Phi,\mathbf{k}}$ given in Sec. IV B are incorrect. Consequently, the expressions for the Beliaev damping rates of the Higgs mode in Eqs. (39), (41), and (42) are also incorrect. The correct expressions for the coefficients are

$$\begin{aligned} u_{A,\mathbf{k}} &\simeq \frac{1}{\sqrt{\Delta_h}}, \\ v_{A,\mathbf{k}} &\simeq \frac{1}{\sqrt{\Delta_h}}, \\ u_{\Phi,\mathbf{k}} &\simeq \sqrt{\frac{u+1}{2\bar{g}_{\text{ng}}|\mathbf{k}|^{\frac{\alpha-d}{2}}}}, \\ v_{\Phi,\mathbf{k}} &\simeq -\sqrt{\frac{u+1}{2\bar{g}_{\text{ng}}|\mathbf{k}|^{\frac{\alpha-d}{2}}}}. \end{aligned}$$

The correct expressions for the Beliaev damping rates in Eqs. (39), (41), and (42) are, respectively,

$$\Gamma_{A,\mathbf{k}=\mathbf{0}} \simeq \frac{Jz_{\text{eff}}\pi}{4(\alpha-d)} \frac{\Omega_d \sqrt{1-u^2}(1+u)}{(2\pi)^d A^{3/2}} \left(\frac{\Delta_h}{2g_{\text{ng}}}\right)^{\frac{5d-3\alpha}{\alpha-d}} \coth \frac{\beta\Delta_h}{4}, \quad (39)$$

$$\Gamma_{A,\mathbf{k}=\mathbf{0}} = \frac{Jz_{\text{eff}}^3(1-u^2)}{32\pi^2} \coth \left(\frac{\beta\Delta_h}{4}\right), \quad (41)$$

$$\Gamma_{A,\mathbf{k}=\mathbf{0}} = \frac{3^{\frac{3}{2}}Jz_{\text{eff}}(1+u)\sqrt{1-u^2}}{4\sqrt{2}\pi} \coth \left(\frac{\beta\Delta_h}{4}\right). \quad (42)$$

Figure 4 of the original paper should be replaced by Fig. 1 herein. These corrections modify the quantitative values of the Beliaev damping rate of the Higgs mode by a factor of 2 but do not affect the main conclusions of the paper.

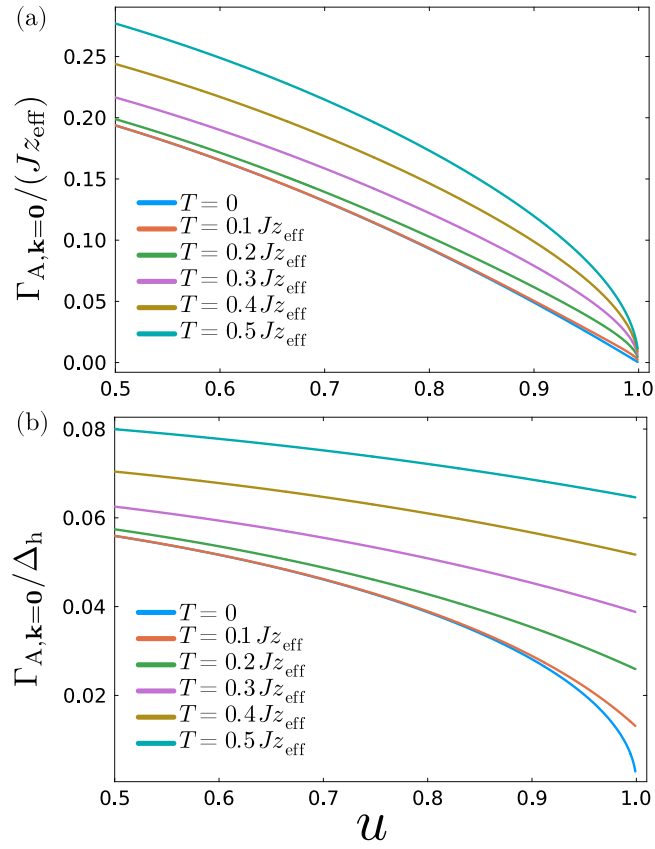


FIG. 1. Beliaev damping rate of the Higgs mode as a function of u for $d=2$ and $\alpha=3$, as given by Eq. (41). (a) $\Gamma_{A,k=0}/(Jz_{\text{eff}})$ and (b) $\Gamma_{A,k=0}/\Delta_h$.