Erratum: Chiral spin liquids at finite temperature in a three-dimensional Kitaev model **[Phys. Rev. B *96*, 174409 (2017)]**

Yasuyuki Kato, Yoshitomo Kamiya, Joji Nasu, and Yukitoshi Motome

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In our paper, there is a missing interaction in the low-energy effective model for the large J_z limit. Accordingly, the effective model [Eqs. (3) and (5) in the original paper], some sentences in Sec. III A, and Fig. 3 need to be corrected. Although the ground-state flux configuration for the large J_z limit is changed by the correction, this error does not affect our main conclusion: The effective model has no frustration, and the system undergoes a strong first-order phase transition from the paramagnetic phase to the chiral spin liquid (CSL).

The low-energy effective model for the large J_z limit is corrected by adding a missing four-body interaction: Eqs. (3) and (5) in the original paper are replaced by

$$\mathcal{H}_{\text{eff}}^z = J \sum_{\langle p, p' \rangle} b_p b_{p'} - J' \sum_{\langle p, p' \rangle} b_p b_{p'} - J^{(4)} \sum_{\langle p_1, p_2, p_3, p_4 \rangle} b_{p_1} b_{p_2} b_{p_3} b_{p_4}, \quad (3)$$

and

$$J = \frac{33}{2048} \frac{J_x^4 J_y^4}{|J_z^7|}, \quad J' = \frac{9}{33} J, \quad J^{(4)} = \frac{1}{2} J, \quad (5)$$

respectively. The sum of $\langle p_1, p_2, p_3, p_4 \rangle$ runs over all the faces of B and R cubes where p_1 – p_4 indicate the corners of each square face.

In Sec. III A 1, the text after the second sentence, “The model has ...,” is replaced by “As J and $J^{(4)}$ are relatively larger than J' in the model in Eq. (3), the lowest-energy flux configuration is a simple staggered one shown in the inset of Fig. 3. The ground-state energy per b_p is simply computed as,” and Eq. (8) is replaced by

$$\varepsilon_{\text{GS}}^z = -\frac{3}{2}(J - J' + J^{(4)}) = -\frac{81}{44}J. \quad (8)$$

Figure 3 in the original paper is replaced by the figure below.

Finally, in Sec. III A 2, the sentence starting from “Without the constraints, ...” is replaced by “Since a similar strong first-order phase transition to a CSL is seen in the MC simulations with $J^{(4)} = 0$, the four-body interaction is not the origin of the strong discontinuity. In addition, without the constraints and the $J^{(4)}$ term, $\mathcal{H}_{\text{eff}}^z$ is merely an unfrustrated Ising model, which undergoes a continuous transition.”

FIG. 3. Temperature dependence of (a) the energy density ε^z and (b) the order parameter $\sqrt{\langle B^2 \rangle}/N_{b_p}$ for the large- J_z effective model $\mathcal{H}_{\text{eff}}^z$ in Eq. (3). We set $J = 1$ ($J' = 9/33$, $J^{(4)} = 1/2$). $\varepsilon_{\text{GS}}^z$ indicates the ground-state energy in Eq. (8) for the b_p configuration in the inset of (b); the black (white) spheres represent $b_p = -1(+1)$ [or $b_p = +1(-1)$], and the numbers denote the sublattices.