Erratum: Effective model with strong Kitaev interactions for α -RuCl₃ **[Phys. Rev. B 97, 134424 (2018)]**

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We have found errors in the original article. Temperatures of the calculated quantities have to be multiplied by 2. We correct our previous results in order.

Figure E1 shows the corrected $C(T)$, $S_Q^x(T)$, and $R^z(T)$ for models 1–4. The high-temperature peak in $C(T)$ appears at $T_h \approx 40, 56, 14,$ and 24 K, respectively. These corrections do not affect the conclusion about models 1–4.

The coupling constants of the large- $|K|$ model are reset in the same way so as to reproduce T_h and T_ℓ in the experimental values. We thus reset $K_z = -25$ and $K_{x/y} = -24.11$ meV. The coupling constants are listed in Table E1.

FIG. E1. Corrected Fig. 6. Temperature dependence of heat-capacity $C(T)$, longitudinal component $R^z(T)$ of the nearest-neighbor spin-spin correlation function, and static spin structure factor $S_Q^x(T)$ at the M point.

TABLE E1. Coupling constants for the corrected large- $|K|$ model. Energy is expressed in meV.

$J_{1st}^{x/y}$	J_{1st}^z	$K_{1st}^{x/y}$	K_{1st}^z	$\Gamma_{1st}^{x/y}$	Γ_{1st}^z	$\Gamma_{1st}^{x/y}$	Γ_{1st}^z
-1.55	-1.49	-24.11	-25	5.24	5.28	-1.08	-0.69

Figure E2(a) shows $C(T)$, $S_Q^x(T)$, and $R^z(T)$ for the corrected large- $|K|$ model. $C(T)$ shows a two-peak structure at $T_h \approx 100$ and $T_\ell \approx 12$ K, which is consistent with the experimental values [1,2]. We also observe the separate growth of $R^z(T)$ and $S_Q^z(T)$. At $T \approx T_h$, $R^z(T)$ saturates, and the phase transition to the magnetic zigzag order is expected at $T \approx T_\ell$, where $S_Q^z(T)$ at the M point starts to saturate.

Figures E2(b)–E2(d) show the static spin structure factor (SSF) and dynamical spin structure factor (DSF) for the large- $|K|$ model. The largest peak of the SSF appears at the M point, which means that the ground state is in the zigzag phase. Although the dispersion curves based on the linear spin-wave theory (LSWT) shift to the lower-energy region, the LSWT curves do not explain the low-lying excitation in the DSF.

Figures E2(e) and E2(f) show the constant-energy cuts of the scattering intensity $\mathcal{I}(\mathbf{Q}, \omega; T = 0)$ integrated over [1.5,3] meV and [9,12] meV, respectively. The former shows the six-pointed star-shaped profile with a large intensity at the Γ point. The latter shows the large intensity centered at the Γ point. They reproduce the typical features of the inelastic neutron-scattering experiments [2,3]. These results sustain our conclusion that the low-energy excitation is governed mainly by the symmetric off-diagonal and Heisenberg interactions.

Figures E3(a)–E3(c) show the field dependence of $S_Q^z(T = 0)$, magnetization curve, and the second derivative of the internal energy, respectively. Upon increasing the in-plane magnetic field, the wave vector of the dominant intensity in $S_Q^z(T = 0)$ switches from the M point to the Γ point at $H \approx 8$ T. The magnetization curve makes a “S-shape” curve and increases gradually towards the saturation value above $H \approx 16$ T. The second derivative of the internal energy $|E''|$ shows a peak at $H \approx 11$ T, meaning that the fully polarized state appears above $H \approx 11$ T. If this magnetic field corresponds to the critical magnetic field where the zigzag magnetic order disappears, the value is slightly higher than the experimental value. However, the results well explain the experiments [4,5].

Figures E3(d) and E3(e) show the field dependence of the terahertz (THz) spectra. The field dependence of the THz spectra is the same as that for the previous large- $|K|$ model except for a spin-gap $\omega \approx 3.3$ meV at $H = 0$ and the slope ≈ 0.24 meV/T of a linear increase in the lowest-energy mode for $H \gtrsim 16$ T in $\mathbf{h}^\omega \perp \mathbf{H}$.

FIG. E2. Results for the corrected large- $|K|$ model. Corrected Fig. 7.

FIG. E3. Results for the corrected large- $|K|$ model. (a)–(c) Corrected Fig. 8 and (d)–(e) corrected Fig. 9.

The corrected large- $|K|$ model does not affect the conclusions of the paper.

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