Giovannetti *et al.* Reply: In the preceding Comment [1], Rocquefelte *et al.* object to the specific values of the magnetic exchange parameters (J_{ij}) obtained using density functional theory (DFT) and used for Monte Carlo simulations in Ref. [2]. The main concern of Rocquefelte *et al.* is that a different set of J's values, as obtained in the Comment, may change the results of the Monte Carlo (MC) simulations significantly.

Our answer to this concern is that the mechanism of Ref. [2] is based on a fundamental symmetry of CuO and therefore is robust with respect to changes in the parameters that do not change the symmetry of the magnetic order. To illustrate this point, we have redone the MC calculations using the J_{ij} parameters of the comment. The spin-current susceptibility shows the same qualitative behavior as in Ref. [2] (see Fig. 1). This is not surprising: the degeneracy between the AF1 and AF2 states is also present for the new set of J_{ij}, and this is indeed the crucial feature that leads to the enhancement of the spin-current susceptibility. The parameter set of Ref. [1] leads to an even better quantitative agreement with the experiment. However, we do not give much significance to this agreement, given several simplifying assumptions in our model (a discrete set of states and the neglect of quantitative effects of quantum fluctuations).

Other minor points raised by Rocquefelte *et al.* are (i) in our model, the correct stacking along y is achieved with a ferromagnetic parameter J_y among parallel spins. Rocquefelte *et al.* obtain the same result with an antiferromagnetic interaction among antiparallel spins which they argue is more realistic. We agree with this conclusion, which is a valid improvement of the model but does not change the conclusions of our work. (ii) The values of J_a and J_b and J_{2a} and J_{2b} have been inadvertently exchanged in Table I of Ref. [2]. The correct values of J's in DFT + U (bond distances) consistent with the notation of Fig. 1 of Ref. [2] are $J_a = 15.82$ meV (2.901 Å), $J_b = 7.98$ meV (3.083 Å), $J_{2a} = 16.18$ meV (4.684 Å), and $J_{2b} = 6.89$ meV (5.129 Å). (iii) As stated in our Letter, we assumed $J_a = J_d$ and $J_b = J_c$ to reduce the number of unknowns. Apparently, Ref. [1] made a different assumption (not an explicit computation of each parameter separately), which leads to different values. Our results do not depend on these assumptions, since they do not affect the fundamental symmetry of the problem. (iv) Ref. [1] has increased the number of magnetic configurations on which the computation of the J's are based. This obviously increases the accuracy of the model. In the future, even more configurations are desirable, as several parameters of CuO still remain undetermined.

The agreement between the previous results reported in Ref. [2] and the ones shown here in Fig. 1 is due to the similarity of the effects that emerge from J_y of Ref. [2] and J_{2a} of Ref. [1]. Both the couplings lead to a ferromagnetic stacking of like planes. The reduction in the transition temperatures observed here is due to a smaller value of J_x and J_{2b}, and not so much due to the change in values of J_y or the introduction of their J_{2a}.

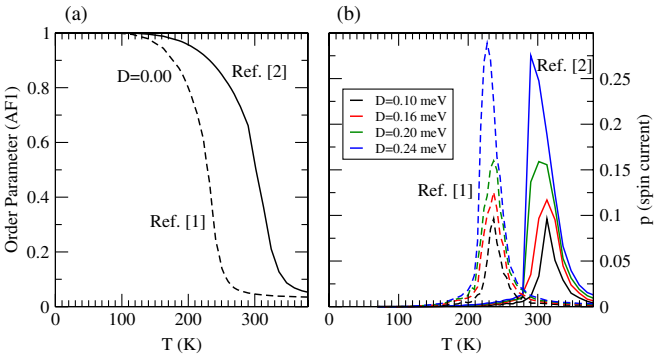

FIG. 1 (color online). (a) Order parameter for the AF1 state with the two sets of J parameters. A wrong conversion factor in Ref. [2] has been corrected, leading to an increase of the Neél temperature (1 meV = 10 K was used in Ref. [2]; we use the correct factor 1 meV = 11.6 K here). (b) The spin current for finite values of the Dzyaloshinskii-Moriya interaction D using the two sets of J parameters.

To conclude, we have explicitly checked that the results of the Monte Carlo simulations are robust. We agree that the parameters presented by Rocquefelte *et al.* are an improvement of the model. However, they do not change qualitatively our results, which are robust, being based on fundamental symmetries of CuO, and they produce only quantitative changes.

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