Liu *et al.* Reply: In the preceding Comment [1], Wang and Wu remark on our results of possible $d + id'$ chiral superconductivity (SC) in bilayer silicene [2]. Through a spin-polarized density-functional-theory (DFT) calculation, they claim that the ground state of the system is antiferromagnetically long-range ordered. Because of this magnetic ordering, a band gap of about 0.29 eV is opened up for the undoped system, and thus the system would be a narrow-gap semiconductor, instead of an intrinsic metal, which closes the door to the formation of SC.

As we will elaborate below, this magnetic ordering is in fact an irrelevant factor to the main physical picture, therefore, we did not discuss it in our Letter. Roughly speaking, it is because the long-range order obtained from the spin-polarized DFT calculation based on mean-field approximation is extremely weak with the largest magnetic moment about $0.1\mu_B$, which cannot survive the dynamic quantum antiferromagnetic fluctuations. The dynamic quantum antiferromagnetic fluctuations go beyond the mean field treatment and are inadequately considered in the spin-polarized DFT calculation that generally overestimates the magnetic order. Therefore, this weak long-range order is easily destroyed and plays no role in the picture, while only the short-range antiferromagnetic fluctuations are present and favor the formation of SC. It is worth pointing out here that this important fact has been ignored in the presentation of the above comment [1].

The optimized magnetic structure obtained from our spin-polarized DFT calculation is ferrimagnetically-ordered within each layer and anti-ferromagnetically-ordered across the two layers. As for the simple mean-field spin-polarized DFT calculations, our results are consistent with those presented in the Comment of Wang and Wu. However, it should be noted here that the magnetic order obtained by this approach is very weak. The magnitude of magnetic moment on the B sublattice is only $0.096\mu_B$, and that on the A sublattice is even smaller, i.e., $0.012\mu_B$ (data from VASP with PBE exchange-correlation functional [3]).

Considering this weak magnetic order, a more accurate code WIEN2K based on the full-potential linearized augmented plane-wave (LAPW) method is used to confirm our results. It is found that the results from the two codes (VASP and WIEN2K) are consistent and yield the maximum magnetic moment of about $0.1\mu_B$, which suggests the reliability of our results.

Physically, such an extremely weak magnetic order as obtained from the mean-field treatment engaged in the spin-polarized DFT calculation cannot survive the dynamic quantum antiferromagnetic spin fluctuations generated by the extra electron-electron correlation neglected in the mean-field treatment. Actually, it is pointed out that due to the noncoplanar structure of silicene which reduces the bandwidth, the electron-electron correlation in the system is considerably strong and cannot be ignored [4]. Generally, in a intermediately- or strongly-correlated electronic system, the mean-field treatment would overestimate the magnetic order. Two good examples can be found in the iron-based superconductors family. One example is the $LaO_{1-x}F_xFeAs$: While the spin-polarized DFT calculations predicted that the magnetic moment in this material is as large as $2.3\mu_B$ [5], the real ordered moment observed by neutron scattering is only $0.36\mu_B$ [6]. Another example is the LaOFeP superconductor: while experiment [7] revealed it to be a nonmagnetic superconductor, the spin-polarized DFT calculations [8] obtained a small magnetic moment of about $0.11\mu_B$ per Fe ion. Here in the bilayer silicene, the ordered moment obtained by mean-field DFT calculation is already as weak as $0.096\mu_B$ ($0.012\mu_B$). Therefore, one can hardly believe that such a weak obtained order can survive the dynamic quantum fluctuation beyond the mean-field treatment.

In conclusion, we point out here that although the mean-field spin-polarized DFT calculation yields a very weak magnetic order which seems to close the door to the formation of SC in the system, such a weak magnetic order actually cannot survive the dynamic quantum antiferromagnetic fluctuations omitted in the mean-field treatment. Instead, the short-ranged antiferromagnetic spin fluctuations would mediate unconventional $d + id'$ SC in the system.

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