Dear copyeditor,

We thank you very much for efficiently handling our manuscript (XW10449B). The corrections are listed below and annotated in the attached PDF file.

Best wishes,

Shi Wang, Zhongyuan Qi, Bin Xi, Wei Wang, Shun-Li Yu, and Jian-Xin Li

Response to all questions listed in the page proof:

1. Please amend “new” to “additional”;
2. Thank you, it is correct;
3. Please amend “BZ” to “Brillouin Zone (BZ)”;
4. Sorry, we have not found the published version of Ref. [18] in any journals. There is only the arXiv version;
5. Thank you, it is correct.

Q

1. For Ref. [17], it should be “F. Ferrari and F. Becca, Phys. Rev. X **9**, 031026 (2019)”

DOI: 10.1103/PhysRevX.9.031026

URL: <https://link.aps.org/doi/10.1103/PhysRevX.9.031026>

1. For Ref. [19], it should be “A. Kitaev, Ann. Phys. **321**, 2 (2006)”

DOI: 10.1016/j.aop.2005.10.005

URL: <http://www.sciencedirect.com/science/article/pii/S0003491605002381>

1. For Ref. [38], it should be “Y. Li, H. Liao, Z. Zhang, S. Li, F. Jin, L. Ling, L. Zhang, Y. Zou, L. Pi, Z. Yang, J. Wang, Z. Wu, and Q. Zhang, Sci. Rep. **5**, 16419 (2015)”

DOI: 10.1038/srep16419

URL: <https://www.nature.com/articles/srep16419>

1. For Ref. [47], it should be “I. Kimchi, A. Nahum, and T. Senthil, Phys. Rev. X **8**, 031028 (2018)”

DOI: 10.1103/PhysRevX.8.031028

URL: <https://link.aps.org/doi/10.1103/PhysRevX.8.031028>

1. For Ref. [48], it should be “J. Iaconis, C. Liu, G. B. Halász, and L. Balents, SciPost Phys. **4**, 003 (2018)”

DOI: 10.21468/SciPostPhys.4.1.003

URL: <https://scipost.org/10.21468/SciPostPhys.4.1.003>

1. For Ref. [60], it should be “P. A. Maksimov, Z. Zhu, S. R. White, and A. L. Chernyshev, Phys. Rev. X **9**, 021017 (2019)”

DOI: 10.1103/PhysRevX.9.021017

URL: <https://link.aps.org/doi/10.1103/PhysRevX.9.021017>

Other corrections:

1. In line 20 in page 1, please amend “we find five phases” to “we find five additional phases”;
2. In line 158 in page 2, please amend “its dual phases” to “its dual phase”;
3. In line 163 in page 2, please amend “we find five phases” to “we find five additional phases”;
4. In line 210 in page 3, please amend “its” to “their”;
5. In line 234 in page 3, please delete “so”;
6. In line 271 in page 4, please delete “as”;
7. In line 294 in page 5, please delete “as”;
8. In line 337 in page 6, please delete “as”;
9. In line 338 in page 6, please delete extra “[” and “]” around Ref. [64];
10. In line 384 in page 6, please amend “BZ” to “Brillouin Zone (BZ)”;
11. In line 460 in page 7, please amend “the third dimension” to “three-dimensional space”;
12. In the second line of the caption of Fig. 8 in page 8, please amend “conditions” to “condition”;
13. In line 572 in page 9, please amend “five phases” to “five addition phases”;
14. In line 627 in page 10, please amend “conditions” to “condition”.