RESPONSE TO THE COMMENTS MADE BY THE REVIEWER – 1

Comment. I read the article and I do not recommend it for publication in its present form. There are no references to generalized AAH models, there is not a clear motivation for the choice of that particular AAH model compared to the conventional one, there is no discussion of the properties of the unconventional AAH model used (without magnetic flux and SSH), and finally there is no comparison with the results one would get considering the SSH and the conventional AAH. If there were a clear discussion about the particular choice of the model, I could deepen the reading but at the moment, in its present form, it seems more like a numerical exercise.

Reply. We apologize for the confusion and thank the referee for the constructive suggestions. In response, we have made the following clarifications and additions:

- We have included additional references related to the generalized AAH model.
- In the Introduction, Subsection K, and Appendix D, we now provide a clearer justification and motivation for the particular model considered in our work

  (In rings with random or Aubry–André–Harper (AAH) site-energy modulation, the persistent current decreases monotonically with disorder and vanishes in the strong limit, with next-nearest-neighbor hopping offering only minor enhancement. In contrast, nearest-neighbor hopping with unit-cell modulation exhibits a nonmonotonic response, showing a disorder-induced peak at half-filling. The generalized AAH (GAAH) model, $\epsilon_n = \lambda\cos(2\pi bn+\phi)/[1-\alpha\cos(2\pi bn+\phi)]$*, introduces an additional tunable parameter* α *that enables independent control of the modulation strength, giving rise to mobility edges and richer localization characteristics. Although extensive studies have examined localization phenomena in GAAH systems, the behavior of persistent current in such settings remains largely unexplored. Motivated by this gap, we investigate transport within a non-interacting tight-binding framework on the Su–Schrieffer–Heeger (SSH) lattice incorporating GAAH modulation in a one-dimensional ring geometry.)*
- As the manuscript is already quite lengthy, we have added an Appendix where we discuss in detail the localization–delocalization aspects, state currents, including system size dependence and, more specifically, the rationale for choosing our model and the essential parameter variations.
- As the results pertaining to the conventional AAH model are well established in earlier studies, we have duly cited the corresponding references (Refs. 63–65) to acknowledge the existing body of work.