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Thermal transport in a superconducting/normal/superconducting topological insulator junction with mixed singlet and triplet pairing states[1] HAI LI, C. S. TING, University of Houston — In the frame of the Bogoliubov-de Gennes equation, we theoretically investigate the thermal transport properties in a superconducting/normal/superconducting topological insulator junction with mixed singlet and triplet pairing states. Owing to the helical spin textures of the topological surface states, the thermal conductance does not decay with the interface potential barrier. Remarkably, it is revealed that the thermal conductance is strongly sensitive to the components of the pairing states. In the singlet state dominated regime, the thermal conductance profoundly depends on the phase deference and decays with increasing the junction length. While for the triplet state dominated situation, the thermal conductance just oscillates with the junction length, but does not exhibit a decaying envelop. Moreover, in the triplet state dominated regime the thermal conductance performs a negligible oscillating characteristic with respect to the phase deference. These intriguing results would provide a novel approach for distinguishing the pairing states of the topological surface states.

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Hai Li
University of Houston

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