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Spin-Pairing Correlations and Spin Polarization of Majorana Bound States in Quantum Spin Hall Systems. KUNHUA ZHANG, ZHENHUA QIAO, University of Science and Technology of China — We demonstrate that zero-energy Majorana bound state in ferromagnetic insulator (FMI)-superconductor (SC) junction formed on the edge states of a quantum spin Hall insulator exhibits three types of spin-triplet pairing correlations, and an additional weak spin-singlet pairing correlation is generated in the presence of coupling between two Majorana bound states in FMI-SC-FMI junction. We show that the position-independent local spin polarization of zero-energy Majorana bound state in ferromagnetic insulator possesses opposite directions in two ferromagnetic insulators when the coupling between the corresponding Majorana bound states is considered. When spin directions of the incident electron and the reflected hole are identical, which two are anti-parallel to that of MBS in ferromagnetic insulator, equal-spin Andreev reflection gives the widest resonance peak. Conversely, equal-spin Andreev reflection results in the narrowest peak. These signatures can facilitate the experimental detection of spin-triplet correlations and spin polarization of Majorana bound states.

Kunhua Zhang
University of Science and Technology of China

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