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MagneticFieldEnhanced Superconducting Proximity Effect in Bi₂Se₃ nanowire Josephson Junctions and their anomalous Shapiro steps FENG JUNYA, SONG ZHIJUN, ZHANG HAO, JI ZHONGQING, LU LI, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, People's Republic of China, THE DANIEL CHEE TSUI LAB TEAM — The superconducting proximity effect between s-wave superconductors and materials with strong spin-orbit coupling is an interesting issue. In this work, we have investigated the magnetic field dependence of the critical supercurrent of Al/Pd-(Bi₂Se₃ nanowires)-Al/Pd proximity effect Josephson junctions. We find that the critical supercurrent of the devices is anomalously enhanced in magnetic field. We have also studied the effect of microwave irradiation on the devices, and found anomalous fractional Shapiro steps. We will discuss the implications of the phenomena observed.

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