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Josephson current and density of states in proximity circuits with s+- superconductors STANISLAV APOSTOLOV, ALEX LEVCHENKO, Michigan State University — We study the emergent proximity effect in mesoscopic circuits which involve conventional superconductor and unconventional pnictide superconductor separated by a diffusive normal or ferromagnetic wire. The focus is placed on revealing signatures of the proposed s^{+-} state of pnictides from the proximity-induced density of states and Josephson current. We find analytically a universal result for the density of states which exhibits both a Thouless gap at low energies, and peculiar features near the superconducting gap edges at higher energies. The latter may be used to discriminate between s^{+-} and s^{++} symmetry scenarios in scanning tunneling spectroscopy experiments. We also calculate Josephson current-phase relationships for different junction configurations, which are found to display robust $0-\pi$ transitions for a wide range of parameters.

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