

Abstract Submitted
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Cooper Pair Wavefunction Approach to SNS Junctions YONG-JIHN KIM, University of Puerto Rico — Recently we introduced a Cooper pair wavefunction approach to the Josephson effects [1]. The approach led to the discovery of threshold resistance in the SIS junctions and more accurate temperature dependence of the DC supercurrent. We apply the approach to the SNS junctions. The Cooper pair wavefunction in the superconductor penetrates into the normal metal, leading to proximity-effect-induced Josephson coupling. The resulting Josephson coupling energy and the supercurrents are calculated from the overlap of the Cooper pair wavefunction of the superconductor and the induced Cooper pair wavefunction of the normal metal near the interface. We calculate the magnitude of the supercurrent at 0K and the temperature dependence of the supercurrent. We compare our theoretical results with experiments. [1] Yong-Jihn Kim, J. Appl. Phys. Vol. 103, 103902 (2008).

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