

Abstract Submitted
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Josephson Current and Multiple Andreev Reflections in Graphene SNS Junctions¹ IVAN SKACHKO, XU DU, EVA Y. ANDREI, Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08854, USA — The Josephson Effect and Superconducting Proximity Effect were observed in Superconductor-Graphene-Superconductor (SGS) Josephson junctions with coherence lengths comparable to the distance between the superconducting leads. By comparing the measured temperature and gate dependence of the supercurrent and the proximity induced sub-gap features (multiple Andreev reflections) to theoretical predictions, we find that the diffusive junction model yields close quantitative agreement with the results. This is consistent with the fact that the measured mean free paths in these junctions, $10 \sim 30$ nm, are significantly shorter than the lead separation. We show that all SGS devices reported so far fall in the diffusive junction category.

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