

Abstract Submitted
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Planar MgB₂ superconductor-normal metal-superconductor Josephson junctions KE CHEN, Y. CUI, QI LI, Department of Physics, The Pennsylvania State University, University Park, X. X. XI, Department of Physics and Department of Materials Science and Engineering, The Pennsylvania State University, University Park, SHANE A. CYBART, Department of Physics, University of California, San Diego, R. C. DYNES, Department of Physics, University of California, Berkeley, X. WEN, J. M. REDWING, Department of Materials Science and Engineering, The Pennsylvania State University, University Park — We have fabricated planar superconductor-normal metal-superconductor (SNS) MgB₂ Josephson junctions using MgB₂ films grown by hybrid physical chemical vapor deposition (HPCVD). The junctions exhibit resistively-shunted-junction-like (RSJ-like) current-voltage characteristics up to 31 K. Ac Josephson effect was observed and the behavior of the Shapiro steps are in good agreement with theoretical predictions. The magnetic field modulation of the critical current also agrees with the thin film planar junction behavior. The junction's behavior can be described by Likharev's proximity effect model with rigid boundary at dirty limit. A dc SQUID with modulation depth of 45 μ V at 29 K has been demonstrated. This work is supported by ONR, NSF, and AFOSR.

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