

Abstract Submitted
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Superconducting proximity effect in MBE grown Nb-InAs junctions¹ CAROLYN KAN, CHI XUE, STEPHANIE LAW, JAMES ECKSTEIN, University of Illinois, Urbana-Champaign — Several proposals for the realization of Majorana fermions rely on excellent quality proximity coupling between a superconductor and a high-mobility semiconductor. We examine the long-range proximity coupling between MBE-grown InAs and in situ grown superconducting overlayers by fabricating transport devices, and investigate the effect of substrate choice and growth conditions on the quality of the MBE InAs. GaAs is commonly available as a high quality insulating substrate. Overcoming its lattice mismatch with InAs using GaSb and AlSb layers results in locally smooth terraced surfaces, but global spiral dislocation structures also appear and have a negative impact on the InAs mobility. Growing InAs on homoepitaxial GaSb results in improved morphology and increases the mean free path. We compare the proximity effect in devices made both ways.

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