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Signatures of Induced Superconductivity in NbTi Contacted InAs Quantum Wells[1] ANTHONY MCFADDEN, ECE Department, University of California - Santa Barbara, JAVAD SHABANI, Physics Department, City College of New York, BORZOYEH SHOJAEI, Materials Department, University of California - Santa Barbara, JOON SUE LEE, California NanoSystems Institute, University of California - Santa Barbara, CHRIS PALMSTRM, ECE and Materials Department, University of California - Santa Barbara — We have studied electrical transport through InAs quantum wells grown by MBE with unannealed superconducting NbTi contacts deposited *ex-situ* and patterned by optical photolithography. Characterization of the InAs 2DEG's without superconducting contacts yields typical mobilities greater than 100,000 cm^2/Vs at a density of 4e11 cm^{-2}. NbTi-InAs-NbTi (SNS) and NbTi-InAs (SN) devices with dimensions greater than 1 m are fabricated using optical lithography. Although the dimensions of the fabricated SNS devices are too large to observe a supercurrent, signatures of superconductivity induced in the InAs are present. We observe two superconducting critical temperatures: one of the NbTi leads (T_c ~8K), and a second (T_c <4.5K) attributed to superconductivity induced in the InAs channel. dI/dV vs V spectroscopy on SNS junctions below the second critical temperature shows a conductance maximum at zero applied voltage while conductance minima appear at finite bias voltage which is attributed to the presence of an induced superconducting gap in the InAs quantum well.

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Anthony McFadden
Univ of California - Santa Barbara

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