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Fabrication of point contacts by FIB patterning[1] B. O'GORMAN, M. TSOI, University of Texas at Austin, Austin, TX — Nanoscale electrical contacts currently receive an increased amount of attention due to their capability to produce extremely high current densities needed, e.g., in experiments on current-driven precession and reversal of magnetization. Here we describe a new technique for the fabrication of such point contacts using a focused ion beam (FIB) patterning. FIB-fabricated point contacts combine the robustness and size-control of other lithographical methods with the flexibility of mechanical techniques to produce contacts to samples of arbitrary shape and composition. After sample coverage with a thin insulating layer (SiO), an FIB is used to mill a 100-nm-diameter hole through the insulator. Electrical contact to the sample is then made in-situ by filling the hole with a metal (Pt) using the ion beam assisted chemical vapor deposition capability of our FIB system. We have demonstrated the use of two such contacts (as an emitter and collector) in a transverse electron focusing (TEF) experiment. The contacts were made to a single crystal of bismuth, ballistic electrons were injected into the crystal through the emitter, and then focused onto the collector by a magnetic field. We see the expected voltage peaks at the collector as a function of the applied magnetic field.

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Maxim Tsoi
University of Texas at Austin

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