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A Technique for In Situ Ballistic Electron Emission Microscopy ROBERT BALSANO, College of Nanoscale Science and Engineering, University at Albany, SUNY, Albany, New York 12203, USA, JOHN GARRAMONE, Dept of Materials Science & Engineering, McCormick School of Engineering & Applied Science, Northwestern University, Evanston, IL 60208-3108, USA, VINCENT LABELLA, College of Nanoscale Science and Engineering, University at Albany, SUNY, Albany, New York 12203, USA — Ballistic electron emission microscopy (BEEM) is a scanning tunneling microscopy (STM) technique that can measure transport of hot electrons through materials and interfaces with high spatial and energetic resolution. BEEM requires an additional contact to ground the metal base layer of a metal semiconductor junction. Performing BEEM in situ with the sample fabrication requires a custom built STM or modifying a commercial one to facilitate the extra contact, which leaves the technique to highly trained experts. This poster will describe our work to develop a special silicon substrate that has the extra contact built in to enable in situ BEEM without modifications to the STM. Electrically isolated contact traces are lithographically patterned ex situ onto the silicon substrate and connected to the BEEM sample plate which is then inserted into the ultra-high vacuum chamber. The metal is then deposited through a shadow mask and then mounted in situ onto the STM for BEEM measurements. BEEM measurements comparing both in situ and ex situ deposited films will be presented.

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