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Design and Construction of a UHV-LT-STM System for Atom Manipulation on MBE Grown Surfaces DANDA-P. ACHARYA, KENDAL CLARK, THY VO, JOEL VAUGHN, SAW-WAI HLA, Nanoscale & Quantum Phenomena Institute, Physics & Astronomy Dept., Ohio University, Athens, OH 45701.
— An ultra-high-vacuum low–temperature scanning-tunneling-microscope (UHV-LT-STM) capable of single atom/molecule manipulation on molecular beam epitaxy (MBE) grown samples has been design and constructed. The STM scanner design is based on a modified Besoke-Beetle type and the thermal drift of the system is less than 0.1 nm/hr, which allows to conduct I-V, dI/dV and vibrational tunneling spectroscopy measurements at single atom level. The freshly grown MBE samples from a separate UHV system can be transferred into our LT-STM system via a portable UHV chamber without exposing the samples to the air. This allows the atom manipulation and STM spectroscopy experiments to be performed on specially tailored surfaces. As demonstrations, single atom manipulation and spectroscopy measurements conducted on Ag(111) and GaN (0001) surfaces at 4.8 K will be presented.
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