Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Integrated Detector for Ballistic Electron Emission Luminescence
BIQIN HUANG, JING XU, IAN APPELBAUM, University of Delaware — Ballistic electron emission luminescence (BEEL) uses injected hot electrons to induce interband transitions and light emission in semiconductor collectors. Local hot electron injection and rastering from a scanning tunneling probe can therefore potentially provide a means to image buried luminescent layers. However, a sensitive photon detector is required to compensate for low external efficiency. We have directly integrated a Si photodetector to a GaAs/AlGaAs BEEL structure by UHV thin-film metal wafer bonding. This room-temperature technique overcomes index mismatch and numerical aperture problems associated with far-field detection. We expect this method will make BEEL microscopy generally applicable to the study of buried luminescent layers in light emitting devices based on arbitrary material systems. THis work is funded by US DOE.

Biqin Huang
University of Delaware

Date submitted: 20 Nov 2007 Electronic form version 1.4