Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Growth and properties of wide band gap II-VI multi-quantum well structures for mid-infrared quantum cascade lasers WILLIAM CHARLES, The City College of New York, KALE FRANZ, Princeton University, AIDONG SHEN, MARIA TAMARGO, The City College of New York, CLAIRE GMACHL, Princeton University — Mid-infrared emission based on intersubband transitions has been recently very actively pursued for the fabrication of quantum cascade lasers (QCLs) operating in that wavelength range. Highly efficient, ultra fast lasing can be achieved from engineered structures in which the emission wavelength is determined by the precisely controlled multi-layered structure rather than the specific materials of choice. However, operation at wavelengths shorter than 3.5 μm is limited by the conduction band offset of the materials currently available. To address this limitation, we have begun to explore wide band gap II-VI ZnCdMgSe materials grown lattice matched to InP substrates for these applications. Recently, we reported the growth and characterization of multi-quantum well structures that exhibit absorption in the 3-5 μm region. We have designed a structure consisting of the active/injector regions of a QCL and fabricated electroluminescent devices. Electroluminescence emission at 4.7 μm has been observed in these structures, suggesting that these materials hold great promise for the fabrication of short wavelength mid-IR QCLs. This work is supported by NSF Grant No. EEC-0540832 (MIRTHE-ERC).

Aidong Shen
The City College of New York

Date submitted: 03 Dec 2007 Electronic form version 1.4