Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

**Contactless Electroreflectance Characterization of a Triple Asymmetric Coupled Quantum Well Active Region of a ZnCdMgSe-Based Quantum Cascade Laser** JOEL DE JESUS, THOR GARCIA, The Graduate Center, CUNY, NY 10016, SIDDHARTH DHOMKAR, Queens College - CUNY, NY 11367, ARVIND RAVIKUMAR, CLAIRE GMACHL, Princeton University, Princeton, NJ 08544, AIDONG CHEN, The City College of New York - CUNY, NY 10031, MARIA TAMARGO, The Graduate Center, CUNY, NY 10016 — Quantum cascade lasers (QCL) with emission at wavelengths below 4$\mu$m are difficult to achieve from conventional GaAs and InP based systems due to the small conduction band offset (CBO) of those materials. The II-VI materials ZnCdSe/ZnCdMgSe, with as much as 1.1 eV CBO and no inter-valley scattering, are excellent candidates to achieve this goal. We grew by MBE a QCL structure made of ZnCdSe and ZnCdMgSe lattice matched to InP. Triple asymmetric coupled quantum well (3ACQW) structures were also grown which contain only the active region of the QCL separated by quaternary barrier layers. The 3ACQW structure was characterized by contactless electroreflectance (CER). A model based on the transfer matrix method (TMM) was used to identify the CER transitions and to predict the Fourier transform infrared (FT-IR) absorption spectrum of the full QCL structure. Excellent agreement between the predicted and the experimental FT-IR absorption peaks was observed.

Joel De Jesus
The Graduate Center, CUNY, NY 10016

Date submitted: 10 Jan 2013 Electronic form version 1.4