Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Study of optical and electronic properties of self-assembled InAs/GaAs quantum rings[1] GABRIEL LINARES, Instituto de Física "Luis Rivera Terrazas," Mexico, Puebla, SAMAR ALSOLAMY, Department of Physics and Astronomy, Ohio University, Athens, Ohio - 45701, MORGAN WARE, YURIY MAZUR, ZHIMING WANG, JIHOON LEE, GREG SALAMO, Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, Arkansas, ERIC STINAFF, Department of Physics and Astronomy, Ohio University, Athens, Ohio - 45701, LILIA MEZA-MONTES, Instituto de Física "Luis Rivera Terrazas," Mexico, Puebla — We will present a theoretical study of the properties of self assembled InAs/GaAs quantum rings. These nanostructures are grown by metal droplet epitaxy and do not follow the traditional strain driven growth model. For certain growth conditions, two quantum dots are formed on the ring structure which then, in a sense, acts as a wetting ring. A 'wetting layer' of 2D InAs is formed by migrating InAs material away from the initial In droplet. We have calculated the eigenstates of electrons and holes inside of the nanostructure using **k•p** theory, within the 1 and 4 bands approximation. We include effects such as the strain, the concentration of Indium and external electric field. The wave functions are then used to calculate optical properties and the energies of various exciton states as a function of the indium concentration and distribution. These results are compared with photoluminescence data on existing structures grown under different conditions. The energies of the various states along with the possibility of energy transfer between the dots will be explored.

[1]Partially supported by Grant CB/2009/133516-CONACyT, Mexico

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Date submitted: 12 Dec 2012 Electronic form version 1.4