Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electrically Pumped Quantum Post Vertical Cavity Surface Emitting Lasers HYOCHUL KIM, MATTHEW RAKHER, DIRK BOUWMEESTER, Physics Department, University of California Santa Barbara, PIERRE PETROFF, Materials Science Department, University of California Santa Barbara — Quantum dot (QD) lasers based on high quality, small mode volume microcavities have shown low lasing current threshold. A novel MBE grown self assembled nanostructure, the quantum post (QP) is also a very good candidate as a gain medium for low threshold lasing. As opposed to the QD laser, the delta function density of states in the QP is associated with multiple vertically and laterally confined states. In addition, QPs have a large carrier capture cross section. We demonstrate very low threshold electrically pumped lasing in oxide apertured vertical cavity surface emitting lasers (VCSELs) with QPs as the active medium and compare their characteristics with similar structure with QDs as the active gain medium.

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Date submitted: 21 Nov 2008 Electronic form version 1.4