

Abstract Submitted
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Terahertz **Absorption**
of (In,Ga)As Quantum Post Nanostructures¹ C.M. MORRIS, D. STEHR,
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PRYOR, Dept. of Physics and Astronomy, University of Iowa, P.M. PETROFF,
Dept. of Electrical and Computer Engineering, UCSB, M.S. SHERWIN, Physics
Dept. and Institute for Quantum and Complex Dynamics — Quantum posts (QPs)
are a new kind of self-assembled semiconductor nanostructure created by vertical
stacking of self-assembled InAs quantum dots into roughly cylindrical In rich re-
gions embedded in a GaAs matrix.² These structures have potential applications for
THz quantum information processing,¹ THz generation, and THz detection. For
a single electron trapped in a 40 nm high QP, the orbital transition between the
ground and first excited state is predicted to occur near 1 THz.² Voltage controlled
electron loading of QPs is measured by capacitance-voltage spectroscopy. Terahertz
absorption spectroscopy of electrons in quantum post samples is demonstrated as a
function of electron loading. ¹ M. S. Sherwin, A. Imamoglu and C. Montroy, PRA
60, 3508 (1999) ² J. He et al, Nanoletters 7, 802 (2007)

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