Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Polarized stimulated emission from photonic molecule states in coupled microdisk lasers[1] X. LI, B.J. COOLEY, N. SAMARTH, Dept. of Physics, Penn State University, University Park PA 16802, F.M. MENDOZA, R.C. MYERS, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara CA 93106 — Recent studies have demonstrated the engineering of spin coherence via photon-spin interactions in microdisk lasers [S. Ghosh *et al.*, Nature (Materials) **5**, 261 (2006)], motivating the extension of such measurements to pairs of microdisks coupled through the evanescent electromagnetic field. Such coupled microdisks behave like "photonic molecules" (PMs) with bonding and antibonding states for the confined photon modes [A. Nakagawa *et al.*, Appl. Phys. Lett. **86**, 04112 (2005)]. We describe the fabrication and optical characterization of different PM geometries, consisting of laterally coupled GaAs/GaAlAs microdisks of both circular and elliptical shape. Steady state photoluminescence measurements reveal bonding and antibonding modes with distinct geometry-dependent polarization characteristics that are consistent with finite-difference time-domain simulations. We also discuss time-resolved optical measurements that probe both carrier and spin dynamics in these PMs.

[1]Supported by NSF.

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Date submitted: 03 Dec 2006 Electronic form version 1.4