Abstract Submitted
for the MAS15 Meeting of
The American Physical Society

Multidimensional coherent spectroscopy of a semiconductor microcavity[1] BRIAN WILMER, West Virginia University, FELIX PASSMANN, TU Dortmund, Dortmund, MICHAEL GEHL, GALINA KHITROVA, The University of Arizona, ALAN BRISTOW, West Virginia University, WEST VIRGINIA COLLABORATION, TU DORTMUND COLLABORATION, THE UNIVERSITY OF ARIZONA COLLABORATION — Two-dimensional coherent spectra map the anticrossing associated with normal-mode splitting in a semiconductor microcavity [1]. For a 12-meV detuning range near zero detuning, two diagonal features related to intra-action of exciton-polariton branches and two off-diagonal features related to coherent interaction between polaritons are observed. At negative detuning, line shape properties of diagonal intra-action features are distinguishable and can be associated with cavitylike and excitonlike modes. A biexcitonic feature is observed, shifted from the exciton feature by the biexciton binding energy. Closer to zero detuning, all features are enhanced and diagonal intra-action features become nearly equal in amplitude and linewidth. At positive detuning excitonlike and cavitylike characteristics return to the diagonal intra-action features. Off-diagonal interaction features exhibit asymmetry in their amplitudes throughout the detuning range. Amplitudes are strongly modulated (and invert) at small positive detuning, as the lower polariton branch crosses the bound biexciton energy determined from negatively detuned spectra.
[1]. Wilmer et al, Phys. Rev. B 91, 201304(R) (2015)

[1]Multidimensional coherent spectroscopy of a semiconductor microcavity

Brian Wilmer
West Virginia University

Date submitted: 16 Sep 2015 Electronic form version 1.4