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Two-dimensional Fourier-Transform spectra of PbS semiconductor quantum dots DENIS KARAISKAJ, PRASENJIT DEY, JASON BYLSMA, Department of physics, University of South Florida — Investigating the correlations of multiple excitons in semiconductor quantum dots is a challenging many-body problem that has drawn considerable experimental and theoretical attention over the last two decades. Nonlinear four-wave mixing experiments have long been known to provide direct probes for the many-body effects in the ultrafast dynamics of excitons in semiconductor nanostructures. With the advent of two-dimentional Fourier-transform (2DFT) spectroscopy many-body contributions can be isolated and identified. 2DFT spectra of colloidal quantum dots will be presented, providing new understanding of the role of many-body interactions in the excitonic decoherence of these nanomaterials.

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