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Longitudinal optical phonon induced exciton dephasing in artificial atoms YIMING MI, School of Fundamental Studies, Shanghai University of Engineering Science, 333 Longteng Rd., Shanghai 201620, China, SHUICHI IWATA, Graduate School of Frontier Sciences, The University of Tokyo — Due to the interactions among longitudinal optical (LO) phonons and artificial atoms (AAs), a new mechanism of LO phonon induced exciton dephasing and spectral broadening has been found. Provided that the full excitonic spectra are considered, this mechanism plays an important role in exciton dephasing and spectral broadening. With the help of an exactly solvable quadratic coupling model and generalizing the exact solution of the model to an arbitrary number of excitonic states, such considerable exciton dephasing in different kinds of AAs is demonstrated in this paper.

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