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Quantum confined Stark effect in direct excitonic states in single InAs/GaAs quantum molecules SWATI RAMANATHAN, MAURICIO GARRIDO, KUSHAL C. WIJESUNDARA, ERIC STINAFF, Department of Physics and Astronomy, and Nanoscale and Quantum Phenomena Institute, Ohio University, Athens, Ohio 45701-2979, USA, ALLAN BRACKER¹, DAN GAMMON, Naval Research Laboratory, Washington, DC 20375, USA — We present a study of the quantum confined Stark effect (QCSE) for direct excitonic states in individual vertically coupled self-assembled InAs/GaAs quantum dots (QDs). The QCSE in coupled QDs is seen to be a function of barrier separation where for large barriers the shift is similar to that observed in single QDs. As the barrier is reduced the shift is found to decrease and eventually change sign. We present data on this effect, and attribute this shift to a change in the permanent dipole moment of the dots. In addition, we study this effect as a function of charge state of the quantum dot, to see how the additional charge affects the dipole moment, and therefore the slope of the charged excitonic state.

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