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Fixed-Phase Path Integral Monte Carlo Simulations in Quantum Dots in Magnetic Fields[1] DAEJIN SHIN, JOHN SHUMWAY, Arizona State University — We have developed a fixed-phase approximation for path integral Monte Carlo (PIMC) simulations. With the fixed phase approximation, the difficulties created by phases in path integrals for magnetic systems are managed in a practical way. We first demonstrate the method on electrons in a 2-D parabolic dot in a magnetic field. The PIMC method allows us to extend the simulation to a realistic 3D model of an InGaAs/GaAs lens-shaped self-assembled dot, so we can study the deviations from an idealized parabolic model. We then apply the method to study the magnetic field dependence of biexciton binding in the different dot models.

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