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Electron Dynamics in AC-Driven Quantum Lenses AREZKY HERNÁNDEZ-RODRíGUEZ, Instituto de Física, Universidad Nacional Autónoma de México, LILIA MEZA-MONTES, Instituto de Física, Universidad Autónoma de Puebla, CARLOS TRALLERO-GINER, Dept. de Física Teórica, Univ. de La Habana, SERGIO ULLOA, Dept. of Physics and Astronomy, Ohio Univ. — We have applied the Floquet formalism to study the effects of an ac electric field applied to quantum dots with lens shape. The electric field is applied along and perpendicular to the direction of the axial symmetry and the time-dependent Hamiltonian in the effective mass approximation is solved. A complete set of orthonormal functions is found to characterize the physical problem while keeping the full lens symmetry. When the electric field is along the axial symmetry axis, we show that the Hilbert space of solutions is separated into orthogonal subspaces with different z-component of the angular momentum. In case of a perpendicular field, the appearance of new dynamical symmetry is studied. We give an explicit analytical representation for the quasi-energy spectrum and electronic states, and show numerical results for different lens parameters and intensity and direction of the electric field. The interplay between the lens shape geometry and the ac driven field (intensity and frequency) are analyzed. Our approach applies to the full range of intensities.

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