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Chaotic dynamics of electron resonant tunneling in a quasi-one-dimensional superlattice PAULA FEKETE, US Military Academy, West Point, NY 10966, GODFREY GUMBS, Hunter College at the City University of New York, NY 10065, DANHONG HUANG, Air Force Research Laboratory, Kirtland Air Force Base, NM 87117, OLEKSIY ROSLYAK, Hunter College at the City University of New York, NY 10065 — A novel approach is employed for studying the dynamics of electron resonant tunneling in a quasi-one-dimensional superlattice. The semi-classical force-balance transport equation is used to describe the time-dependence of the dynamical equation for the electron center-of-mass velocity in the presence of an applied DC electric field and two external AC fields. Evolution of phase space trajectories from initial non-equilibrium states is obtained. The attractors of this dynamical system are determined and their stability for different sets of system parameters is obtained. Coupling between the electron's velocity and the external fields gives rise to rich spatiotemporal behavior including chaos.

Paula Fekete
US Military Academy, West Point, NY 10966

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