

# TRANSIENT DYNAMICS OF CHARGED PARTICLES INTERACTING WITH RF PULSES\*

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A modified canonical perturbation method is employed for analyzing the charged particle dynamics as they interact with RF pulses, having the form of localized waves with continuous spectrum. In contrast with periodic Hamiltonian models, where the method has already been applied in a multitude of respective systems, the system in hand is inherently aperiodic. The localized waves, considered in this work, are amplitude-modulated electrostatic waves, ranging from ordinary wavepackets and solitons to ultrashort few-cycle and sub-cycle transient pulses. Particle interactions with such waves is interesting for applications in RF plasma heating as well as for the investigation of the damping and absorption of localized waves in plasmas. The analytically obtained approximate invariants of the motion contain rich information for the strongly inhomogeneous structure of the phase space and the respective distribution functions. The analytical results are in good agreement with results from direct numerical integration of the equations of motion.

## References

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