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PS3-13 Numerical Simulations of Transversal Deflections of Electrons in Tightly Focused Gaussian Laser Beams Necessary for Production of Femtosecond Oscilloscopes and Trains of Attosecond Bunches

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Many recent analytical and numerical calculations show that stable electron acceleration in vacuum and production of attosecond electron bunches are possible only with the help of very high intensity laser beams, while the calculations [1] carried out only in plane wave approximation show that weaker laser beams are required in order to obtain significant transversal deflection of high energy electron beams. Before the construction of femtosecond oscilloscopes and production of attosecond high energy electron pulses which will have wide applications in many fields, in this work the equations of motion of electron beams with various parameters are solved numerically using expressions for various laser beam polarizations [2]. The simulations of the trajectories confirm the results of [1] about the possibility of time domain measurements and production of subfemtosecond electron bunches.

References

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2. Y.I. Salamin, S.X. Hu, K.Z. Hatsagortsyan, C.H. Keitel, Phys. Rep. 427, 41-155, 2006; Y.I. Salamin, New Journal of Physics, 8, 133, 2006.

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