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Maxwell Boltzmann Bloch modeling of the complex and non-equilibrium dynamics of matter exposed to XUV radiation

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Abstract

Interaction of intense ultrashort extreme ultraviolet (XUV) and soft x-ray pulses of sub-picosecond duration with matter will be described. For the irradiated few level system of interest the light-field induced electron dynamics will be modeled via combined Maxwell-Bloch-Boltzmann approach [1–3] coupled to time evolution of the population of the levels of the system [4]. A comparison will be made between results obtained using direct coherent single photon excitation and the ones computed via Atomic code. Other relevant processes such as Auger recombination and radiative recombination will be also considered. The formalism has implications in semiconductor lasers, generation of high harmonics in matter as well as in the nuclear excitation by electron capture.

References

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