Electrons, ions and nuclei in extremely intense laser pulses

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Abstract: Laser-driven relativistic quantum dynamics of single particles is introduced [1] and corresponding applications such as the characterization of extreme laser pulses are presented [2]. Special emphasis is placed here on recent results on spin effects for Kapitza-Dirac scattering [3] and the feasibility of pair creation [1,4]. Then, mono energetic ion acceleration from plasmas with chirped laser pulses is discussed [5] followed by XFEL interactions with highly charged ions [6] and nuclei [7,8].

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