Manipulating Electrons with Intense Laser Pulses

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Laser Plasma Accelerators (LPA) rely on the control of the electronic motion with intense laser pulses [1]. The manipulation of electrons with intense laser pulses allows a fine mapping of the longitudinal and radial components of giant electric fields that can be therefore optimized for accelerating charged particle or for producing X rays.
To illustrate the beauty of laser plasma accelerators I will show different experimental results that we recently performed that allow to improve the quality of the electron beam, its stability [2] and its energy gain in longitudinal field [3], or the reduction of its divergence using radial field [4].
I'll then show how by controlling the quiver motion of relativistic electrons intense and bright X-rays beam are produced in a compact and elegant way [5,6]. Finally I'll show some examples of applications [7].

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