Societal Applications of Laser Plasma Accelerators

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The tremendous progresses of laser plasma accelerators [1] that produce high quality electron beams in a compact, stable and controllable way [2] have opened new horizons for the design of future accelerators for delivering ultra-bright electron or X-ray beam [3]. The quest for compact and bright sources is motivated by a constantly growing demand by the scientific community with applications in industry, medicine and basic research [4]. After showing briefly the state-of-the-art of electron and X-ray beams produced with intense laser beams, I will discuss their applications to domains such cancer therapy, cancer tumour imaging, for security and for ultra-fast science. In each case, I will discuss the level of maturity and of pertinence.

[1] V. Malka *et al*., Science
[2] J. Faure *et al*., Nature, 444, 737–739, 2006.
[3] S. Corde *et al*., Rev. of Mod. Phys., 85,1 (2013)
[4] V. Malka *et al*., Nature Physics **4**, 447 (2008)