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Effect of the laser wavefront in a laser-plasma accelerator[1] ALINE VERNIER, B. BEAUREPAIRE, M. BOCOUM, F. BÖHLE, A. JULLIEN, J.-P. ROUSSEAU, T. LEFROU, G. IAQUANIELLO, R. LOPEZ-MARTENS, A. LIFSCHITZ, J. FAURE, Laboratoire d'Optique Appliquée, UMR 7639 ENSTA-CNRS-Ecole Polytechnique — Laser-plasma accelerators are a promising alternative as they can currently provide short (down to a few fs), relativistic (from a few MeV up to a few GeV) electron beams over millimeter distances. In such devices, an intense laser pulse drives a plasma wave in which self-injected electrons can be accelerated. The quality, in terms of emittance, of such electron beams is known to strongly depend on the laser focal spot, but very little attention is generally given to the laser transverse distribution on either side of the focal plane. Our recent experimental results and PIC simulations quantify the role of the wavefront at the focus on the acceleration of eletrons: distortions of the laser wavefront cause spatial inhomogeneity of the out-of-focus laser intensity distribution and consequently, the laser pulse drives a transversely inhomogenous wakefield whose focusing/defocusing properties affect the electron distribution.

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