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Numerical study of the focusing and propagation of complex laser pulses in under-dense plasmas

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We report on some recent work for the inclusion of more realistic and complex laser pulses in the simulations of the Quasi-static PIC code WAKE and the PIC code CALDER-CIRC. Optical aberration in the driving laser pulse can deteriorate the quality of the accelerated electron bunch and limit the acceleration length. In the present work we study the influence of some perturbations in the phase of intense laser pulses on the propagation in under-dense plasmas. We also present simulation results on the focusing of laser pulses with axicon-type mirrors aimed at creating a guiding plasma channel prior to the main pulse.

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