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Zemax simulations for laser propagation in plasma waveguides

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Plasma-based waveguides are currently employed for laser wakefield acceleration to extend the focal region of laser beams. Indeed, a parabolic transverse plasma density profile can be formed in a dielectric capillary as a thermal consequence of a gas discharge.

In this work, we report on a new ray tracing model, based on the Zemax software, able to simulate the envelope of a laser beam propagating through a plasma waveguide. Thanks to the tools offered by Zemax, an ideal interferometry measurement will be shown as well as the design of a curved capillary.

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