CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO NAZIONALE DI OTTICA

SEMINARIO

giovedì 21 aprile 2016 ore 11:00 – Aula 33

Area della Ricerca CNR di Pisa - Edificio A, piano Terra

Dr. Stefan HÜELLER

Centre de Physique Théorique, CNRS, Ecole Polytechnique, Palaiseau, France

Crossed Beam Energy Transfer (CBET) revisited: the role of laser speckles in presence of self-focusing and of beam deflection

Abstract.

We investigate Crossed Beam Energy Transport (CBET) between intense 'smoothed' laser beams commonly used for high power laser beams. This is currently of high interest in both the direct- and indirect ignition schemes for laser fusion. In expanding laser plasmas, the transfer between beams of equal wave length occurs where the expansion velocity is close to the sound speed. A recent study [1] shows that CBET is relatively well understood for the regime of moderate laser beam intensities, $I_L\lambda_{2\,L} < 2\times10^{14}\mathrm{W/cm^2\mu m^2}$.
At higher intensities, where one or both crossing beams are subject to self-focusing, the energy exchange is modified due to both (i) self-focusing laser speckles, and (ii) due to laser beam deflection [2, 3, 4, 5]. The latter considerably modifies the angular spectrum of the outgoing light with respect to the two separate incoming beams. Important parameters are the speckle size (speckle f-number), the number of laser speckles in the crossing volume, the power of the overall beam and the power in intense laser speckles compared to the self-focusing critical power. Our studies are based on simulations with our multi-dimensional code HARMONY.

References

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