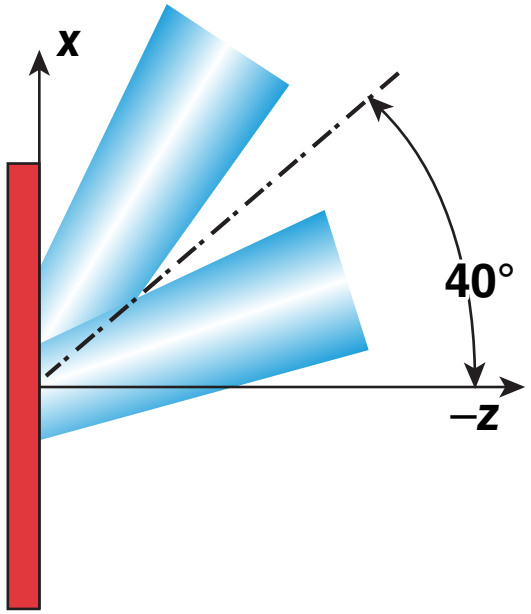
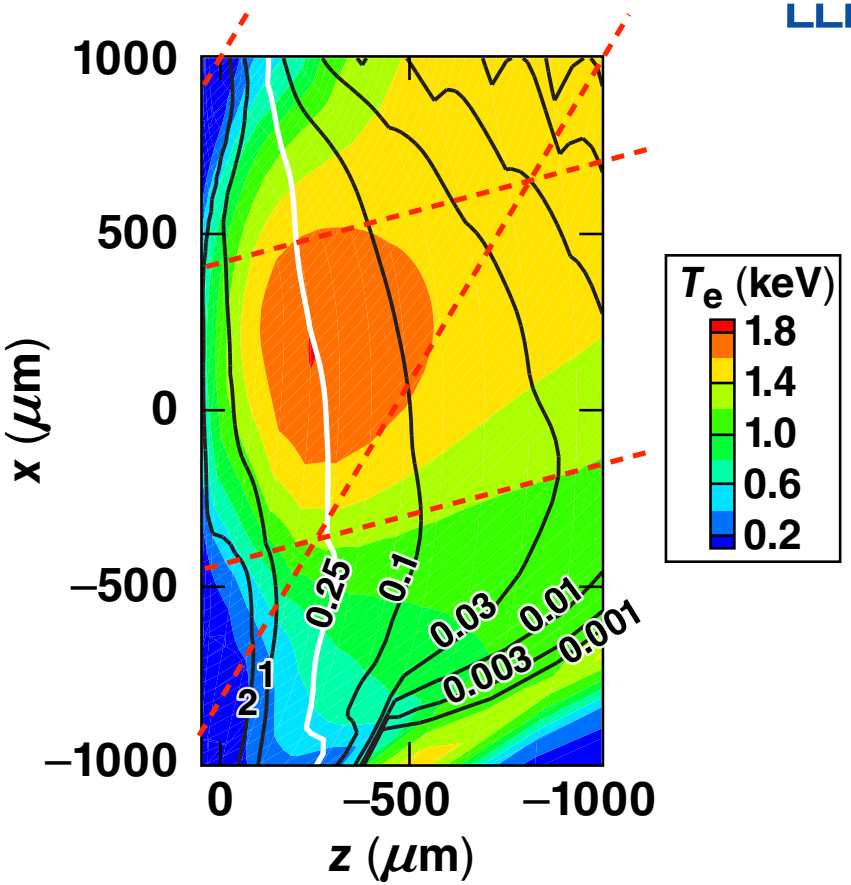
Three-Dimensional Numerical Investigation of Oblique Laser Irradiation of Planar Targets





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Summary

Three-dimensional *HYDRA** simulations studied the effect of oblique incidence on plasma conditions in planar targets

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- Planar experiments are proposed to study the two-plasmon-decay (TPD) instability from oblique incident beams
- Tilting the target by 40° with respect to the centroid of two OMEGA EP beams results in the deformation of the $n_c/4$ surface
- 3-D plasma evolution must be taken into account in the design of planar experiments

*M. M. Marinak *et al.*, Phys. Plasmas 5, 1125 (1998).

Collaborators

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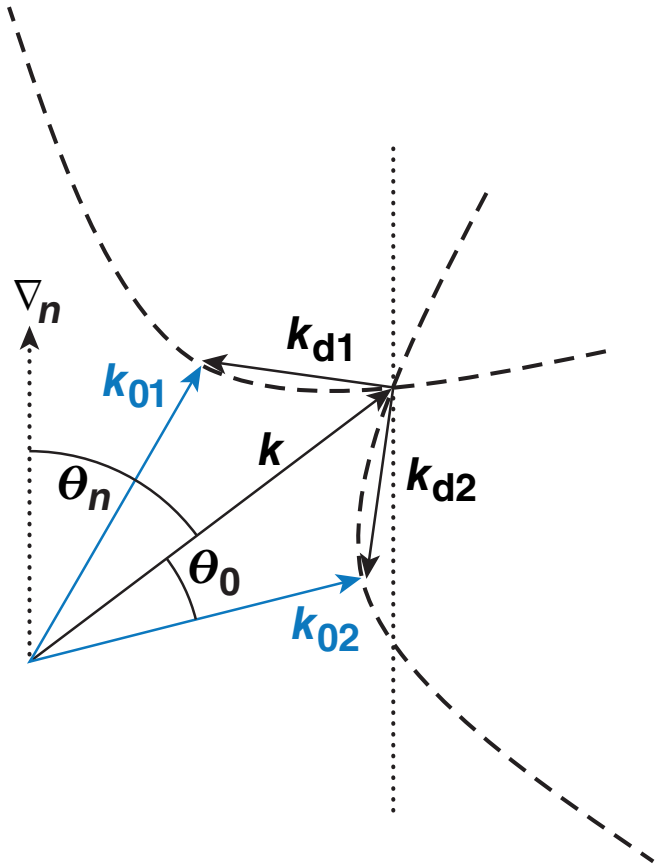
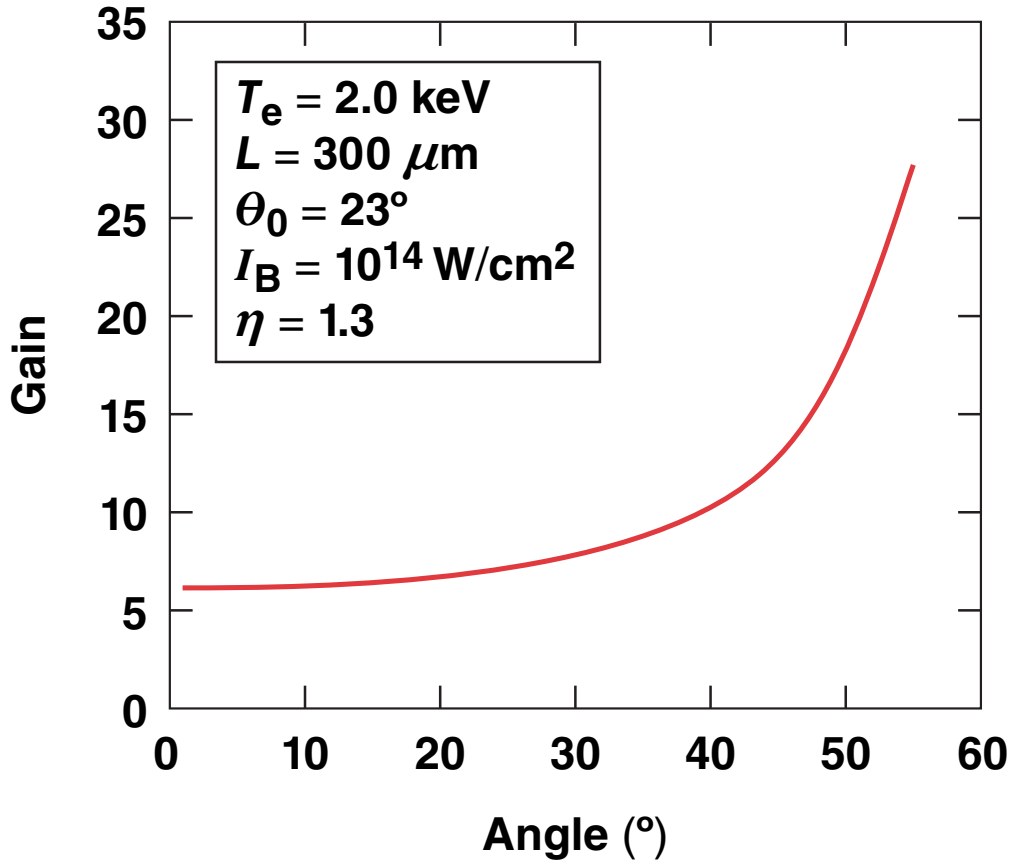
Recent studies have shown that the TPD collective gain for crossing beams depends on their incidence angles





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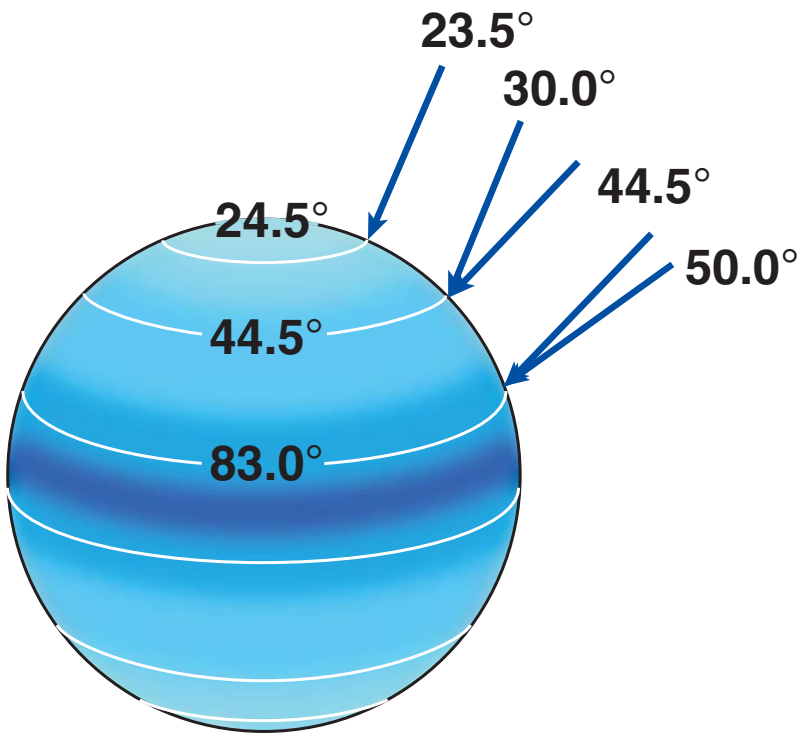
R. W. Short, UO6.00012, this conference

Oblique incident beams occur in both symmetric spherical illumination and polar-drive illumination



In spherical illumination the angle between the centroid of crossing beams and the electron-density gradient can reach 40°.

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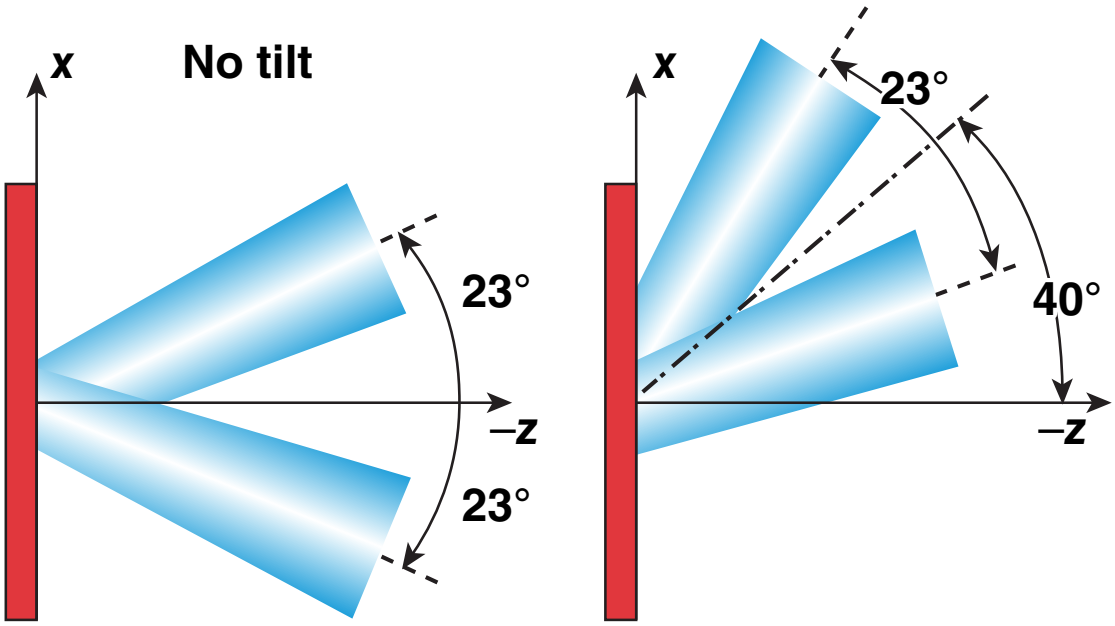
Experiments to study the effect on TPD of tilting the target are planned on the Omega laser facility

The target is modeled with beams tilted 40° from normal to the target surface



Simulation parameters

- 2-kJ, 0.353-μm beams
- 2-ns square pulse
- 1/*e* beam radius: 355 μm
- 4×10^{14} W/cm^2
- OMEGA EP has four beams, 23° from axis of symmetry

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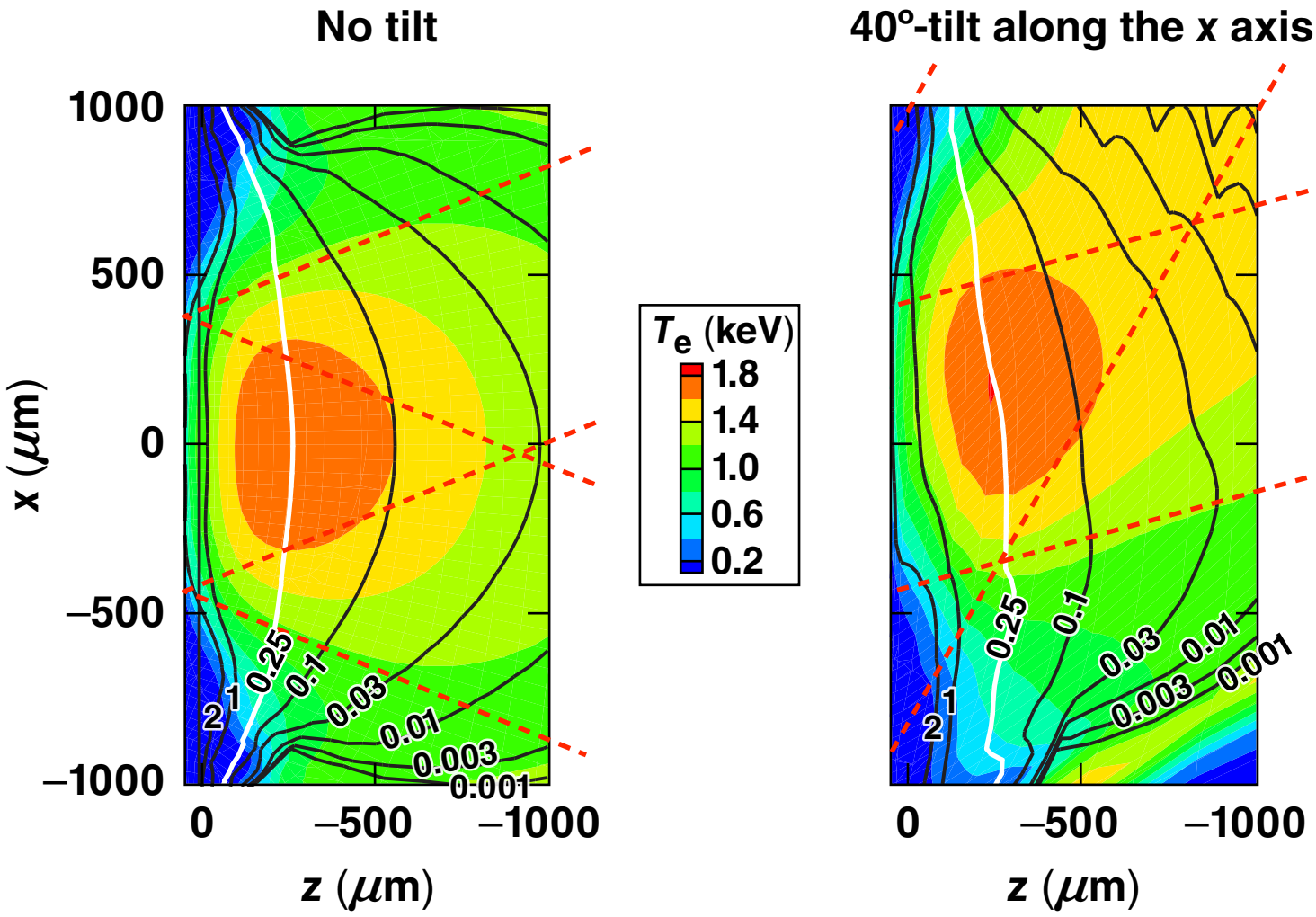
A slice at $y = 0$ shows that the $n_c/4$ surface is asymmetric to the target normal



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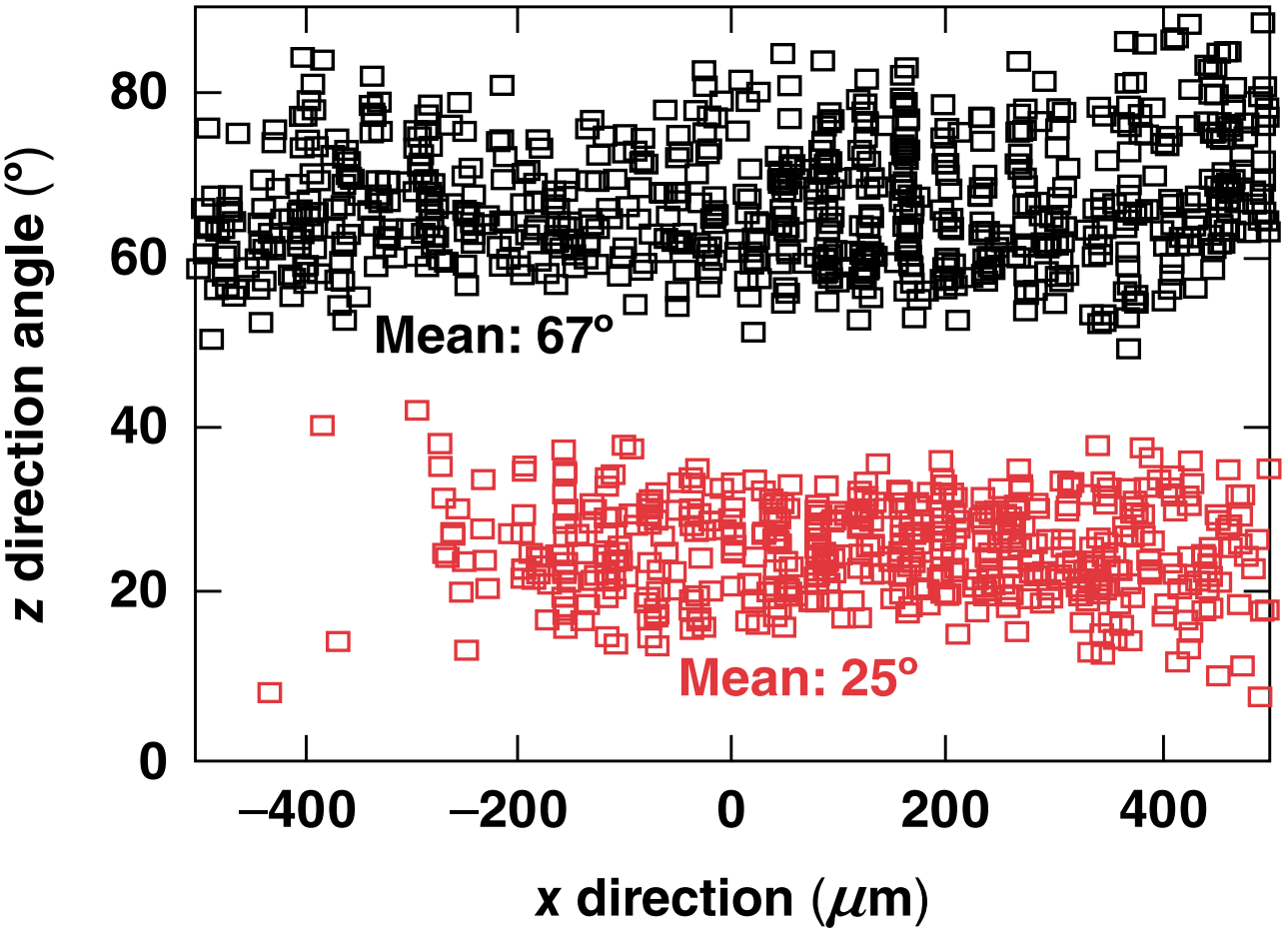
In 3-D, the rays shift to steeper angles as a result of the evolution of the $n_c/4$ surface



Tilted case (63°) beam

No-tilt case (23°) beam

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Summary/Conclusions

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