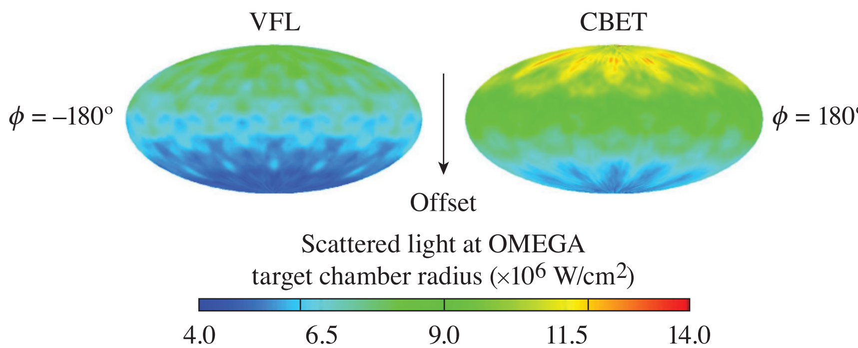
About the Cover:

Shown on the cover are two plots suggesting cross-beam energy transfer (CBET) as one explanation for why the observed target performance has historically experienced relatively low sensitivity to target offset, in contrast to simulation models. While CBET has been well known to cause significant laser-energy losses to directly driven inertial confinement implosions, fewer studies had been performed that include the effects of CBET on the symmetry of direct-drive inertial confinement fusion implosions. This is because of the computational expense in including CBET physics in multidimensional simulations. Its effects are often substituted for the simpler, flux-limited Spitzer–Härm thermal-transport method, where the flux limiter is variable in time [i.e., variable flux limit (VFL)] and chosen to match the observables of more-detailed 1-D simulations, which include the nonlocal thermal transport (NLTT) and CBET physics. This new work by Kenneth Anderson (see p. 127) demonstrates that by including CBET in simulations with offset, implosion asymmetry caused by target offset is actually mitigated compared to the aforementioned substitutive models. The inset depicts the predicted power deposited by the laser in the $\ell = 1$ mode when a target is offset. For most of the laser main drive, CBET losses dramatically reduce the $\ell = 1$ mode compared to the commonly used VFL model. The main image then expands this result to multiple simulations across a wide variety of target offsets. We can see that the simulated yield trends show less degradation at high offset when CBET is included than when using the VFL model. These results are useful in highlighting the importance of the 3-D laser ray-trace model including CBET when modeling target offset to accurately capture this asymmetry mitigation and to give better agreement with experimental observables.

The figure on the right shows the enhanced scattered light predicted with CBET when target offset is present. More specifically, it shows more CBET occurring on the face of the target closer to target chamber center, where laser intensity is highest compared to the side facing away. In other words, this shows CBET counteracting the effects of offset-induced laser-illumination asymmetry.



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