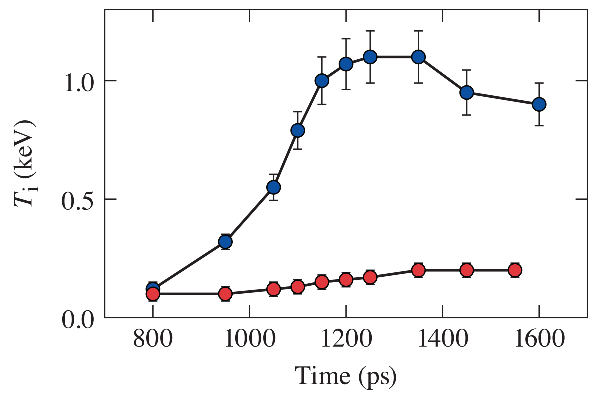
About the Cover:

The cover depicts the experimental configuration used to study cross-beam energy transfer (CBET) saturation on OMEGA. In this setup, several pump laser beams (blue) transfer energy into the tunable Omega Port 9 (TOP9) probe laser (red) by resonantly driving an ion-acoustic wave grating in a gas-jet plasma. The top left figure shows the ratio of the output power (P) to the incident power (P_0) of the probe beam calculated using a linear kinetic CBET model for the conditions of these experiments over a range of nitrogen ion temperatures. The top right figure shows the total laser intensity, pulse shapes, and beam timings for each of the beam groups. The bottom left figure shows the transmitted beam diagnostic data showing the input- (dashed red curve) and output- (solid black curve) probe and pump (solid blue curve) powers. The bottom right figure shows the time-resolved Thomson-scattering spectrum that was used to infer the background plasma conditions.

The figure (right) shows the measured ion temperatures for shots at low and high intensities. For the low-intensity shot (red circles), the ion temperature remained low throughout the experiment, consistent with hydrodynamic predictions. For the high-intensity shot (blue circles), the ion temperature increased during the CBET interaction and the final ion temperature ($T_i \approx 1$ keV) significantly exceeded the electron temperature ($T_e \approx 0.6$ keV). This ion heating is a direct result of energy conservation in the CBET interaction and must be accounted for in hydrodynamic simulations to accurately predict the ion temperature in the presence of significant CBET.



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