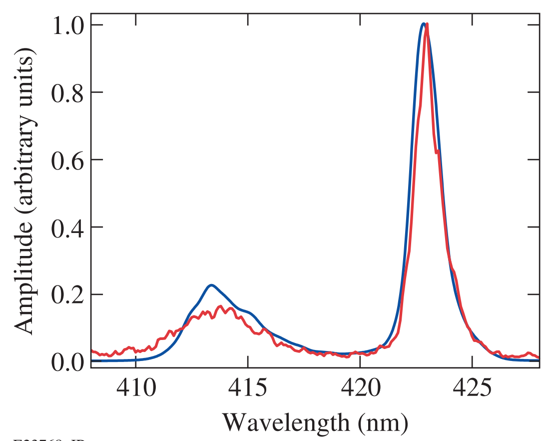
About the Cover:

The photo on the cover shows Physics and Astronomy graduate student R. K. Follett who reports on the direct observation of electron plasma waves driven by multibeam two-plasmon decay (TPD) using ultraviolet Thomson scattering. In inertial confinement fusion experiments, the TPD instability has the potential to generate large-amplitude electron plasma waves that accelerate electrons to high energies. In these experiments, Thomson scattering provides a measure of the electron plasma wave amplitudes responsible for accelerating the electrons. Simulated Thomson-scattering spectra from 3-D numerical solutions of the extended Zakharov equations of TPD are in excellent agreement with the experimental spectra. The cover background is Thomson-scattering spectra from an experiment, where five laser beams were focused onto a planar target.

Recent theories and modeling have suggested that when multiple laser beams are used, their interactions with electron plasma waves can be synchronized by phase coupling to common decay waves. The figure shown here illustrates a longer-wavelength feature that is the direct observation of TPD waves driven by multiple laser beams. The shorter-wavelength peak corresponds to electron plasma waves generated by the Langmuir decay of backscattered TPD waves. The numerical Thomson-scattering spectra (blue curve) calculated by the 3-D fluid code *LPSE* show excellent quantitative agreement with the measured spectra (red curve). This is an encouraging result, demonstrating that *LPSE* includes the relevant physics to capture the TPD-driven electron plasma wave amplitudes. *LPSE* has recently been extended to use these wave amplitudes to calculate the hot-electron spectrum.



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