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Using Krypton K-shell Emission as a Diagnostic of Fuel Conditions in Implosions of SIO2 Shells MARK GUNDERSON, DOUGLAS WILSON, GEORGE KYRALA, JOHN BENAGE, Los Alamos National Laboratory — To study how hi-Z impurities in imploding capsules affect the equilibration of ion, electron, and radiation temperatures, the D3He fill gas of SIO2 shells have been doped with various amounts of krypton and xenon. If xenon is used as the main adjustable impurity affecting this equilibration, the amount of krypton placed in the D3He fill gas can be kept at a level that minimizes the optical depth of the krypton K-shell emission lines. With the small optical depths, these emission lines can provide important time-resolved information on the electron temperature in the imploding fuel through the analysis of the relative intensities of the lines. With sufficient spectral resolution, these lines can even provide time-resolved information on the electron density of the imploding fuel by analyzing the widths of the emission lines. Used in conjunction with the emitted proton spectrum from which time-resolved ion temperature and rhoR can be inferred, we can directly study the effect of hi-Z impurities on temperature equilibration and yield.

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