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Electron Temperature Measurement of Buried Layer Targets Using Time Resolved K-shell Spectroscopy[1] EDWARD MARLEY, M. E. FOORD, R. SHEPHERD, P. BEIERSDORFER, G. BROWN, H. CHEN, J. EMIG, M. SCHNEIDER, K. WIDMANN, H. SCOTT, R. LONDON, M. MARTIN, B. WILSON, C. IGLESIAS, C. MAUCHE, H. WHITLEY, J. NILSEN, Lawrence Livermore National Laboratory, D. HOARTY, S. JAMES, C.R.D. BROWN, M. HILL, P. ALLAN, L. HOBBS, Atomic Weapons Establishment — Short pulse laser-heated buried layer experiments have been performed with the goal of creating plasmas with mass densities $\geq$ 1 g/cm^3 and electron temperatures $\geq$ 500 eV. The buried layer geometry has the advantage of rapid energy deposition before significant hydrodynamic expansion occurs. For brief periods ($<$ 40 ps) this provides a low gradient, high density platform for studying emission characteristics under extreme plasma conditions. A study of plasma conditions achievable using the Orion laser facility has been performed. Time resolved K-shell spectroscopy was used to determine the temperature evolution of buried layer aluminum foil targets. The measured evolution is compared to a 2-D PIC simulation done using LSP, which shows late time heating from the non-thermal electron population.

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Edward Marley
Lawrence Livermore National Laboratory

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