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Studies of the effects of radiation trapping and radial gradients in short-pulse laser heated targets ANDREW MCKELVEY, LLNL, University of Michigan, RONNIE SHEPHERD, HOWARD SCOTT, PETER BEIERSDORFER, GREG BROWN, BRIAN WILSON, CARLOS IGLESIAS, RICHARD LONDON, MADISON MARTIN, CHRIS MAUCHE, JOE NILSEN, LLNL, DAVID HOARTY, COLIN BROWN, MATTHEW HILL, LAUREN HOBBS, STEVEN JAMES, AWE — Short-pulse, laser heated buried layers have demonstrated a promising capability in determining opacities of high temperature, high density plasma. A critical aspect of utilizing these data is inferring the plasma conditions using a K-shell tracer. Collisional-radiative models are often employed to determine which plasma conditions can generate a spectrum that will match observations. These models invoke approximations to increase computational tractability, such as escape factors, and require assumptions about the uniformity of the emitting plasma. We test these by comparing calculations of optical trapping using escape factors and full radiation transport against angularly and temporally resolved K-shell data from buried silicon dots at 2 g/cc and 600 eV. Additionally, we explore the impact of radial gradients on the inferred temperature evolution using 2D simulations with various radial temperature gradients.

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