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Inference of Electron Density in the Hot Spot of NIF Compressed Capsules from Krypton Helium-β Stark Line Shapes[1] K W HILL, M BITTER, L GAO, B F KRAUS, P C EFTHIMION, PPPL, M B SCHNEIDER, D B THORN, H CHEN, R L KAUFFMAN, D A LIEDAHL, M J MACDONALD, A G MACPHEE, H D WHITLEY, LLNL, R DORON, E STAMBULCHIK, Y MARON, Weizmann Institute of Science — The dHIRES x-ray spectrometer measures Kr Heα and Heβ spectra from NIF compressed capsules with 10-eV spectral and 30-ps temporal resolution. Theoretical calculations of the Stark-broadened line shape of the Heβ complex ($3\ ^3P_1$, $^1P_1$, $^1D_2$) show monotonic variations with density of the line widths, line energies, and intensity of the $3\ ^3P_1$ and $3\ ^1D_2$ lines relative to the main, $3\ ^1P_1$ peak. Comparison of the measured Kr Heβ complex line profiles with the theoretical line shapes provides a measure of the time history of the electron density. These comparisons will be shown for four NIF shots with Kr-doped capsules.

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