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High resolution spectrometer concepts for high temperature EXAFS measurements and 1D imaging of ignition capsules on NIF K. W. HILL, M. BITTER, L. GAO, B. KRAUS, P. C. EFTHIMION, Princeton Plasma Physics Lab, M. B. SCHNEIDER, D. B. THORN, F. COPPARI, Y. PING, K. L. KILLEBREW, A. G. MACPHEE, R. L. KAUFFMAN, P. BEIERSDORFER, Lawrence Livermore National Lab — X-ray spectrometer concepts for two applications on NIF are being studied. An Extended X-ray Absorption Fine Structure (EXAFS) spectrometer will determine temperature at high pressure of dynamically compressed materials, by measuring K and L3 absorption edges at energies from 7112 to 18000 eV. A Johann geometry with spherically or toroidally bent crystals will avoid source-size broadening for spectral resolving power ($E/\Delta E$) of ~ 6000 . Energy-range selection is by crystal choice. The second is a 1D imaging spectrometer to measure the spatial distribution of plasma parameters to study stagnation of ignition capsules, based on either spherical or conical crystals with large spatial magnification. The desired spatial resolution is $5 \mu\text{m}$. Predicted performance and prototype spectrometer measurements will be presented.

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