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On Shot Diagnostics at the 400 TW SCARLET Laser Facility¹ DOUGLAS E. WERTEPNY, FRANKI AYMOND, KEVIN M. GEORGE, SCOTT FEISTER, SHENG JIANG, ENAM A. CHOWDHURY, LINN D. VAN WO-ERKOM, RICHARD R. FREEMAN, The Ohio State University, Department of Physics, Columbus, OH 43210 — As high power, ultra-short laser technology has advanced, in recent years, this has presented a unique set of challenges in precisely measuring the characteristics of femtosecond-scale laser pulses. Overcoming these complications to obtain reliable measurements of pulse duration and intensity requires an array of complementary diagnostics operating in parallel. The Ohio State University's 400 TW SCARLET Laser Facility will employ a second-order autocorrelator, third-order cross-correlator, SPIDER (Spectral Phase Interferometry for Direct Electric-field Reconstruction) and water cell to monitor temporal beam quality. Additionally, beam wavefront aberrations, which lead to focal spot distortion, will be measured by a wavefront sensor outside the target chamber and corrected with adaptive optics. These diagnostics will ensure on-target focused intensities greater than 10^{22} W/cm², thus allowing cutting-edge, high energy density experiments to be performed at the Ohio State SCARLET Laser Facility.

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