Abstract Submitted
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Fast, deep record length, time-resolved visible spectroscopy of plasmas using fiber grids[1] SAMUEL BROCKINGTON, ANDREW CASE, EDWARD CRUZ, F. DOUGLAS WITHERSPOON, HyperV Technologies Corp, ROBERT HORTON, RUTH KLAUSER, D. Q. HWANG, University of California at Davis — HyperV Technologies is developing a fiber-coupled, deep-record-length, low-light camera head for performing high time resolution spectroscopy on visible emission from plasma events. New solid-state Silicon Photo-Multiplier (SiPM) chips are capable of single photon event detection and high speed data acquisition. By coupling the output of a spectrometer to an imaging fiber bundle connected to a bank of amplified SiPMs, time-resolved spectroscopic imagers of 100 to 1,000 pixels can be constructed. Target pixel performance is 10 Megaframes/sec with record lengths of up to 256,000 frames yielding 25.6 milliseconds of record at10 Megasamples/sec resolution. Pixel resolutions of 8 to 12 bits are pos- sible. Pixel pitch can be refined by using grids of 100 m to 1000 m diameter fibers. A prototype 32-pixel spectroscopic imager employing this technique was constructed and successfully tested at the University of California at Davis Compact Toroid Injection Experiment (CTIX) as a full demonstration of the concept. Experimental results will be dis-cussed, along with future plans for the Phase 2 project, and potential applications to plasma experiments .

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