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10.28 Characterization of a Picosecond Gated Optical Intensifier

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The development of high speed imaging detectors is crucial for high-temperature plasma characterization and optimization. These detectors must perform within many strict parameters, such as precise timing, high spatial resolution, low noise, high gain, and fast gating. We present test results on a picosecond gated optical intensifier (GOI) that meets these requirements. The detector was developed by Kentech, and is part of a packaged Sydor solution of 1-8 detectors, designed for use in plasma diagnostics. It has low jitter (STD ~4 ps) and gate widths less than 80 ps. We use a pulsed laser to test the gate profile and the spatial resolution performance of the intensifier at different points within the gate. We investigate gain, saturation, and noise. We anticipate that this GOI will have many applications. Katz et al. have used a GOI to image scattered 3ω light refracted off plasma density gradients in order to better understand cross-beam energy transfer [1]; faster gate times will reduce blur. These GOIs have been implemented on Orion for 2D VISAR [2], and will soon be used on the Z machine as well. 1. Katz, et al., OLUGW, (2017). 2. A.L. Meadowcroft, et al., Plasma Phys. Note 49/15 (2015).

Primary author(s) : LITTLE, Bethany (Sydor Technologies)

Co-author(s) : FISHER, Yoram (Sydor Technologies)

Presenter(s) : LITTLE, Bethany (Sydor Technologies); FISHER, Yoram (Sydor Technologies)

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