

## Sub-nanosecond Single Line-of-Sight (SLOS) X-ray Imager Development\*

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A new fast-gated x-ray framing camera has been developed that can capture multiple frames from a single line-of-sight with 25 ps temporal resolution. This performance has been achieved by the integration of electron pulse-dilation imaging [1] with a nanosecond-gated burst mode CMOS sensor [2]. Electron pulse-dilation imaging is a technique that has been used to increase the temporal resolution of x-ray framing cameras up to 100X. Burst mode CMOS sensors can capture multiple frames from a single input image by storing information locally, in pixel, and then reading out post-shot. The combination of these two transformative technologies enables a new class of x-ray imagers that will have significant impact in HED diagnostic applications requiring high temporal and spatial resolution. Here, we present the system architecture and results from characterization experiments using a short-pulse uv laser. We will also discuss ongoing development and future plans for instruments to be deployed at the HED facilities: NIF, Z and Omega.

### References

[1] T. J. Hilsabeck, et. al., *Rev. Sci. Instrum.* **81**, 10E317 (2010).

[2] L. Claus, et. al., *Proc. SPIE* **9591**, 95910P (2015).

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