

HTPD 2018



Contribution ID : 294

Type : not specified

14.34 The Single Line-of-Sight, Time-Resolved X-Ray Imager on OMEGA

Thursday, 19 April 2018 10:31 (120)

The single-line-of-sight, time-resolved x-ray imager (SLOS-TRXI) on OMEGA is a new generation of fast-gated x-ray cameras comprising an electron pulse-dilation imager [1] and a nanosecond-gated, burst-mode hybrid complementary metal-oxide semiconductor sensor.[2] SLOS-TRXI images the core of imploded cryogenic deuterium-tritium shells in inertial confinement fusion experiments in the ~ 4 - to 9-keV photon energy range with a pinhole imager onto a photocathode. The diagnostic is mounted on a fixed port almost perpendicular to a 16-channel, framing-camera-based, time-resolved Kirkpatrick-Baez microscope,[3] providing a second time-gated line-of-sight for hot-spot imaging on OMEGA. The diagnostic achieves ~ 30 -ps temporal resolution and a spatial resolution of $\sim 10 \mu\text{m}$. Shots with neutron yields of up to $1e14$ were taken without any hint of neutron-induced background signal. The implosion images from SLOS-TRXI show the evolution of the stagnating core. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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

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

[3] F. J. Marshall et al., Rev. Sci. Instrum. 88, 093702 (2017).

Primary author(s) : WOLFGANG, Theobald (Laboratory for Laser Energetics, University of Rochester)

Co-author(s) : SORCE, Charles (Laboratory for Laser Energetics, University of Rochester); BEDZYK, Mark (Laboratory for Laser Energetics, University of Rochester); IVANCIC, Steven T. (Laboratory for Laser Energetics, University of Rochester); MARSHALL, Frederic J. (Laboratory for Laser Energetics, University of Rochester); STOECKL, Christian (Laboratory for Laser Energetics, University of Rochester); SHAH, Rahul C. (Laboratory for Laser Energetics, University of Rochester); LAWRIE, Michael (Laboratory for Laser Energetics, University of Rochester); REGAN, Sean P. (Laboratory for Laser Energetics, University of Rochester); SANGSTER, T. Craig (Laboratory for Laser Energetics, University of Rochester); CAMPBELL, E. Michael (Laboratory for Laser Energetics, University of Rochester); HILSABECK, Terry (General Atomics); ENGELHORN, Kyle (General Atomics); KILKENNY, Joe D. (General Atomics); MORRIS, Dean (General Atomics); CHUNG, Mark (TMC2 Innovations LLC); HARES, Jonathan D. (Kentech Instruments Ltd); DYMOKE BRADSHAW, Anthony K. L. (Kentech Instruments Ltd); BELL, Perry M. (Lawrence Livermore National Laboratory); CELESTE, John R. (Lawrence Livermore National Laboratory); CARPENTER, Arthur C. (Lawrence Livermore National Laboratory); DAYTON, Matthew (Lawrence Livermore National Laboratory); BRADLEY, Dave K. (Lawrence Livermore National Laboratory); JACKSON, Mark C. (Lawrence Livermore National Laboratory); PICKWORTH, Louisa A. (Lawrence Livermore National Laboratory); NAGEL, Sabrina (Lawrence Livermore National Laboratory); ROCHAU, Greg (Sandia National Laboratories); PORTER, John (Sandia National Laboratories); SANCHEZ, Marcos (Sandia National Laboratories); CLAUS, Liam (Sandia National Laboratories); ROBERTSON, G. (Sandia National Laboratories); LOOKER, Q. (Sandia National Laboratories)

Presenter(s) : WOLFGANG, Theobald (Laboratory for Laser Energetics, University of Rochester); SORCE, Charles (Laboratory for Laser Energetics, University of Rochester); BEDZYK, Mark (Laboratory for Laser Energetics, University of Rochester); IVANCIC, Steven T. (Laboratory for Laser Energetics, University of Rochester); MARSHALL, Frederic J. (Laboratory for Laser Energetics, University of Rochester); STOECKL, Christian (Laboratory for Laser Energetics, University of Rochester); SHAH, Rahul C. (Laboratory for Laser Energetics, University of Rochester); LAWRIE, Michael (Laboratory for Laser Energetics, University of Rochester); REGAN, Sean P. (Laboratory for Laser Energetics, University of Rochester); SANGSTER, T. Craig (Laboratory for Laser Energetics, University of Rochester); CAMPBELL, E. Michael (Laboratory for Laser Energetics, University of Rochester); HILSABECK, Terry (General Atomics); ENGELHORN, Kyle (General Atomics); KILKENNY, Joe D. (General Atomics); MORRIS, Dean (General Atomics); CHUNG, Mark (TMC2 Innovations LLC); HARES, Jonathan D. (Kentech Instruments Ltd); DYMOKE BRADSHAW, Anthony K. L. (Kentech Instruments Ltd); BELL, Perry M. (Lawrence Livermore National Laboratory); CELESTE, John R. (Lawrence Livermore National Laboratory); CARPENTER, Arthur C. (Lawrence Livermore National Laboratory); DAYTON, Matthew (Lawrence Livermore National Laboratory); BRADLEY, Dave K. (Lawrence Livermore National Laboratory); JACKSON, Mark C. (Lawrence Livermore National Laboratory); PICKWORTH, Louisa A. (Lawrence Livermore National Laboratory); NAGEL, Sabrina (Lawrence Livermore National Laboratory); ROCHAU, Greg (Sandia National Laboratories); PORTER, John (Sandia National Laboratories); SANCHEZ, Marcos (Sandia National Laboratories); CLAUS, Liam (Sandia National Laboratories); ROBERTSON, G. (Sandia National Laboratories); LOOKER, Q. (Sandia National Laboratories)

Session Classification : Session #14. Thursday Morning Poster Session