HTPD 2018

Contribution ID : **289** Type : **not specified**

14.29 Multichannel X-Ray Hot-Spot Imager Operating in the 5- to 30-keV Range on OMEGA

Thursday, 19 April 2018 10:31 (120)

A design is presented of a multichannel x-ray imager spanning energies from 5 to 30 keV for use as a fixed-port diagnostic for OMEGA experiments. The purpose of the absolute, multichannel imaging radiation diagnostic is to infer electron temperature Te and thereby provide a new approach to existing hot-spot temperature and pressure measurements. In contrast to the standard approach of inferring ion temperature from fusion neutrons, this x-ray based technique is insensitive to hydrodynamic motions. Absolute x-ray yield will be measured in channels defined by increasing amounts of titanium filtration and this signal will be used to fit a parameterized hot-spot emission model. The range is selected to probe optically thin x-rays and provide 100-eV sensitivity of inferred Te. The multispectral imaging will use a hybrid-penumbral approach so as to separate the hot-spot from coronal hot-electron emission yet maximize signal. Magnification will be 10× and 20× for ˜5- to 10-μm resolution of the hot-spot as recorded on a time-integrated, absolutely calibrated image-plate detector. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

Primary author(s) : SHAH, Rahul (Laboratory for Laser Energetics, University of Rochester)

Co-author(s) : CAO, D. (Laboratory for Laser Energetics, University of Rochester); EPSTEIN, R. (Laboratory for Laser Energetics, University of Rochester); REGAN, S.P. (Laboratory for Laser Energetics, University of Rochester); THEOBALD, W. (Laboratory for Laser Energetics, University of Rochester); KRAUS, B. (Princeton Plasma Physics Laboratory); GAO, L. (Princeton Plasma Physics Laboratory); HILL, K. (Princeton Plasma Physics Laboratory); STRATTON, B. (Princeton Plasma Physics Laboratory); EFTHIMION, P. (Princeton Plasma Physics Laboratory); BACHMANN, B. (Lawrence Livermore National Laboratory)

Presenter(s) : SHAH, Rahul (Laboratory for Laser Energetics, University of Rochester); CAO, D. (Laboratory for Laser Energetics, University of Rochester); EPSTEIN, R. (Laboratory for Laser Energetics, University of Rochester); REGAN, S.P. (Laboratory for Laser Energetics, University of Rochester); THEOBALD, W. (Laboratory for Laser Energetics, University of Rochester); KRAUS, B. (Princeton Plasma Physics Laboratory); GAO, L. (Princeton Plasma Physics Laboratory); HILL, K. (Princeton Plasma Physics Laboratory); STRATTON, B. (Princeton Plasma Physics Laboratory); EFTHIMION, P. (Princeton Plasma Physics Laboratory); BACHMANN, B. (Lawrence Livermore National Laboratory)

Session Classification : Session #14. Thursday Morning Poster Session