

HTPD 2018



Contribution ID : 218

Type : not specified

4.37 Two monochromatic channels high resolution X-ray imaging of laser produced plasma using Fresnel zone plate

Monday, 16 April 2018 20:31 (120)

Monochromatic X-ray imaging at micron scale is a convenient tool for studying the dense plasma produced by laser facilities. We use a microscope made of a gold transmission Fresnel Phase Zone plate (FPZP) which has high spatial resolution capability (1-5 μm) and high efficiency so called Fresnel Ultra High Resolution Imager (FUHRI). We show the interest to combine a FPZP with a multilayer mirror (ML) which selects a narrow X-ray bandwidth. This device allows to choose the imaging wavelength by modifying the focal length and the angle of ML. Following the development of this diagnostic we have improved the system by using two side-by-side FPZPs, or bi-FPZP, in order to image two different photon energies range simultaneously. We present experimental imaging studies of plasma X-ray sources with FPZP's at the following material edges with corresponding photon energies of: Ti He α (~ 4.7 keV), Al He β (~ 1850 eV) and Al Ly β (~ 2050 eV). A second set of bi-FPZP, manufactured by the Paul Scherrer Institut (PSI)^a, with smaller outermost zone width of 120 nm and a larger aperture, were designed to simultaneously observe Al He β and Ly β lines. We compare the radiography measurement using such FZPs realized at EQUINOX laser facility (CEA). a)<https://www.psi.ch/>

Primary author(s) : DO, Alexandre (LULI)

Co-author(s) : BRIAT, Michelle (Commissariat à l'Energie Atomique); RUBBELYNCK, Christophe (Commissariat à l'Energie Atomique); LEBUGLE, Maxime (Paul Scherrer Institut); DAVID, Christian (Paul Scherrer Institut); TROUSSEL, Philippe (Commissariat à l'Energie Atomique)

Presenter(s) : DO, Alexandre (LULI); BRIAT, Michelle (Commissariat à l'Energie Atomique); RUBBELYNCK, Christophe (Commissariat à l'Energie Atomique); LEBUGLE, Maxime (Paul Scherrer Institut); DAVID, Christian (Paul Scherrer Institut); TROUSSEL, Philippe (Commissariat à l'Energie Atomique)

Session Classification : Session #4, Monday Night Poster Session