Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Development of X-ray imaging microscopes for LMJ PHILIPPE TROUSSEL, RUDOLPH ROSCH, CHARLES REVERDIN, GÉRARD SOULLIÉ, JEAN YVES BOUTIN, RÉMY MARMORET, ANDRÉ RICHARD, CEA, DAM,DIF, F-91297 Arpajon, France, FRANCOISE BRIDOU, FRANCK DELMOTTE, Laboratoire Charles Fabry, Institut d'Optique Graduate School, CNRS, Université Paris-Sud, Campus Polytechnique, RD128, 91127 Palaiseau, France — For the future Laser Megajoules French facility (LMJ), our laboratory develops time-resolved X-ray Imaging systems to diagnose laser produced plasma. In this presentation, we describe the design of these imagers which combine grazing X-ray microscope and camera. A first set of three imaging diagnostics will give basic measurements during all the life of the facility : two twelve-image microscopes focalize X-rays from the target on a framing camera. The third one produces an image on a streak camera. These microscopes also contain refractive lenses to extend the spectral range up to 15 keV. A second set of diagnostics will consist of advanced high resolution X-ray imaging systems. Imaging studies performed with a microscope composed of three concave toroidal mirrors are presented. This microscope, working at 0.6 degrees grazing incidence, has a focal length longer than 80 cm. About the imaging performances, we have achieved a spatial resolution of about 6 microns for the sagittal dimension and around 10 microns for the tangential dimension within a field of 1 mm. To increase the bandwidth of reflectivity of all these mirrors until 10 keV, multilayer coatings have been deposited.

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Date submitted: 16 Sep 2010 Electronic form version 1.4