



HELIL Plasma Diagnostics Hard X-ray multiple imaging On Streak Camera Optical part



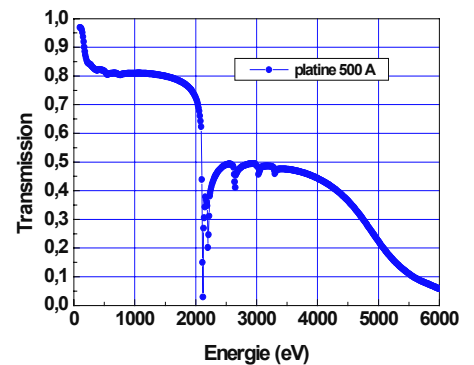
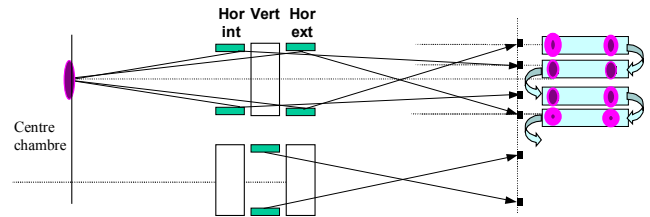
Design - CEA DAM DCRE

Several 2D images from the plasma source emission are formed, in a selected direction, using Kirckpatrick-Baez type microscopes – couple of crossed curved mirrors in grazing incidence.

The number of microscopes is multiplied (**8 ways**) in order to get simultaneously the desired number and spatial distribution of images on the detector surface.

The detector is an integral image streak camera which allows to select temporally the various images.

The streak camera is composed of a tapered fiber optic plate, a luminescent screen and a film (or CCD).



Technical specifications of the optical part

- Resolution higher than **15 μm** for **1 mm** object size
- Transmission of intensity better than 10 %
- Source to microscope distance **500 mm ± 25 mm**
- Magnification 8
- Angular opening **0.5 mrad**
- Distribution of images on the detector surface according to a rectangular network of **4 lines spaced out by 9.15 mm** with **2 images per line, spaced by 18.3 mm**
- Precision on the positioning of each image **± 0.4 mm**.

Definition

- Platinum coating on silicate spherical mirror
- Grazing angles : inside mirror 0.8° - outside mirror 0.9°
- Spherical radius 42 m ± 0.5 m
- Slope error 0.4"
- Roughness 3 Å
- Relative location of centres 20"

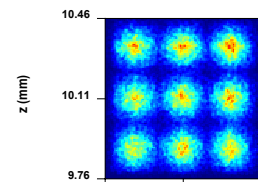
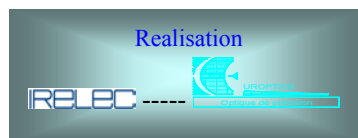
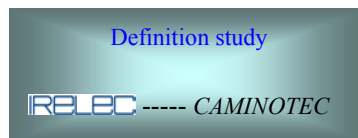
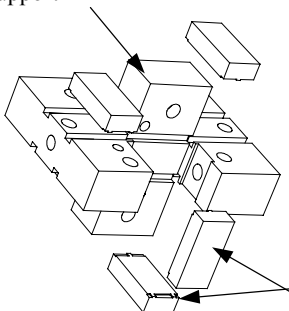
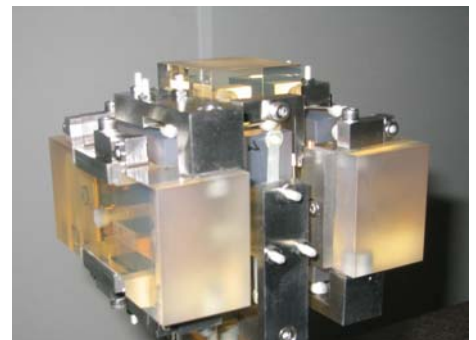


Image of a grid of 3×3 objects (15 μm size) on the side of field of observation

Support



Mechanical assembly of the mirrors to facilitate their replacement in case of damage
Use under vacuum 10^{-6} mbar.



Issue 05-2003