Fiber plate alignment

Prerequisites

You need:

– A laptop with software able to read and display pro silica camera images as life images and the possibility to measure positions on the image.

– A prosilica camera GC 1350 (Illustration 1) with power supply and ethernet cable

– The mount (Illustration 2) for the prosilica camera including the screws (to be found in the carton in the aluminum ARGOS box from MPIA)

– A set of metric Allan keys
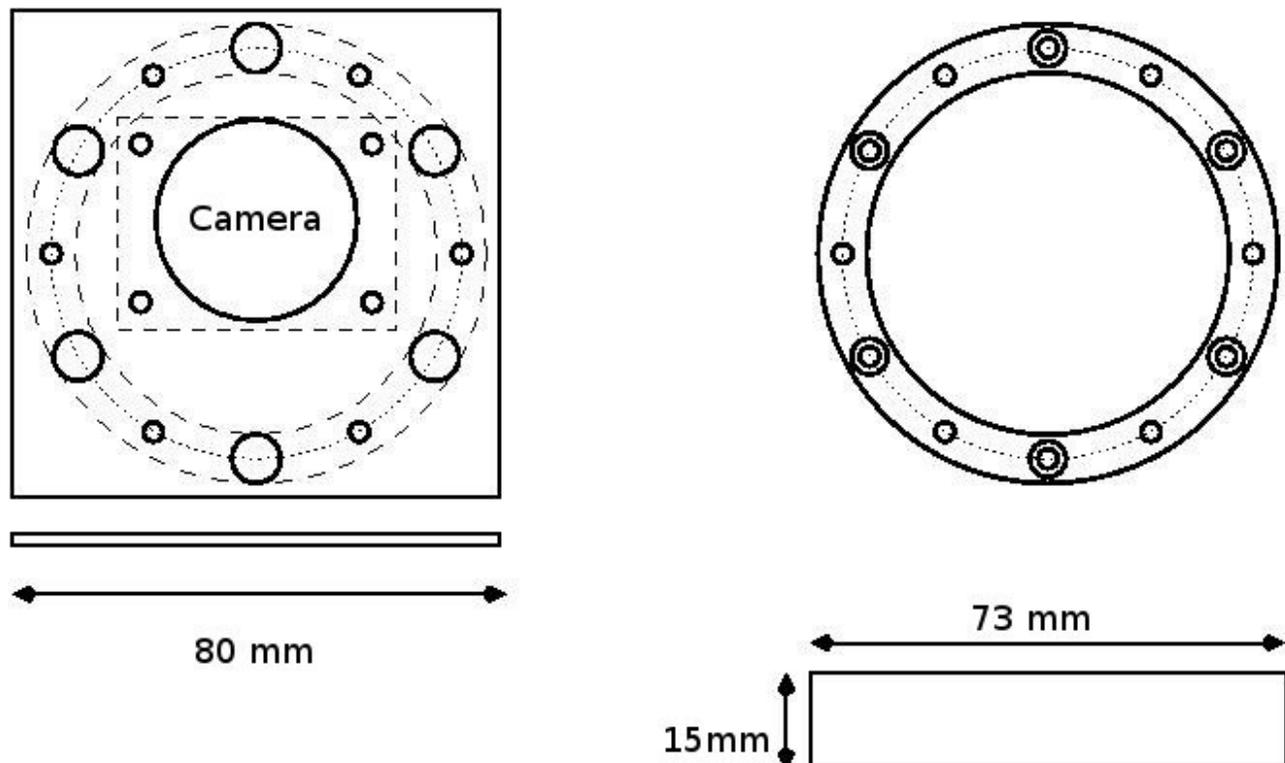

Illustration 1: Prosilica GC 1350

Illustration 2: Drawing of camera mount for Fiber plate alignment.

Before aligning the fiber plate the following conditions need to be met:

– The green diode sources are connected and switched on

– The camera needs to be running and images are displayed

Alignment of Fiber plate

Mounting procedure

First mount the fiber plate such that the fibers are at the same clocking angle as the three (sub-) holograms on the CGH

The **mounting procedure** of the camera onto the CalUnit is as follows:

– Mount the camera to the mounting plate

– Mount the plate to the ring

– Mount everything to the CalUnit such that the camera sees one of the three spots

If possible the camera should be oriented such that the spot is aligned along the camera axes as in Illustration 3 and not as in Illustration 4.

This is because the apparent brightness on the camera is aligned with the camera axes. So it is more difficult to see the symmetry of the spot if it is not aligned to the camera axes.
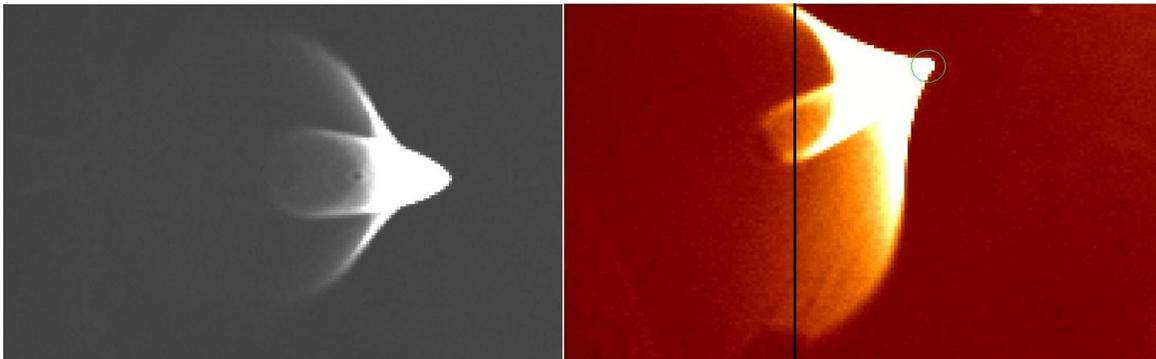

Illustration 4: spot shape in the case of an aligned Fiber plate.

Illustration 3: Spot shape and illumination in case of an aligned fiber plate but a clocking between spot axis and camera axes. Note the tendency of the brightness distribution to be oriented along the camera axes as marked by the black line.

Alignment

The **alignment** itself is done as follows:

The fiber plate is slightly unscrewed in order to be able to rotate it. In the beginning one will see an image like the following Illustration 5. It can be seen clearly that the two 'wings' of the spot are very different. The goal is to make the spot symmetric in shape (Illustration 3). Then the Fiber plate is

aligned. The symmetry is measure as shown in Illustration 6:

The 'inner structure' of the spot is used to construct the red line, which cuts the structure in half. Then a
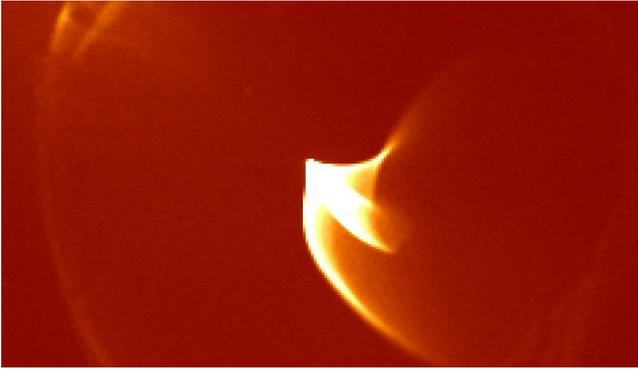

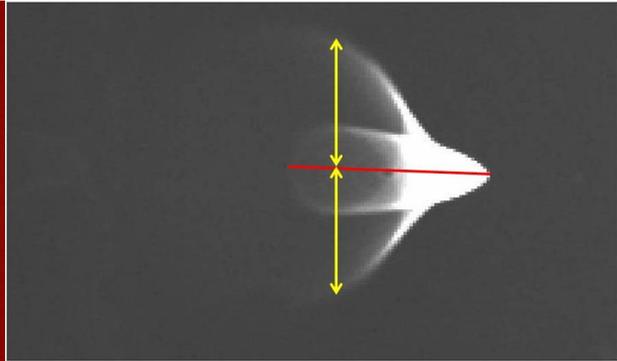*Illustration 5: Spot shape in the case of a misaligned Fiber plate.*

Illustration 6: How to measure if the fiber plate is aligned.

line orthogonal to it is constructed and the distance to the outer rim of the spot is measured. This distance must be the same in both directions.

If this condition is met, the fiber plate is fixed to the CalUnit tube.