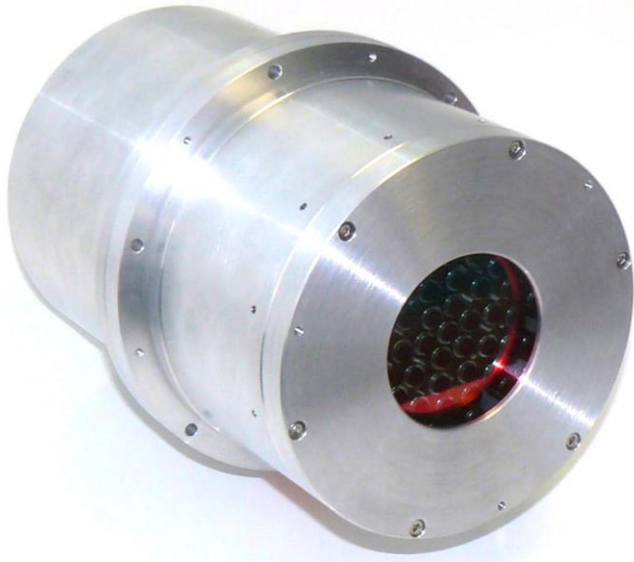


Update : 12/20/2022



- *Polishing mirror defaults and optical system aberrations corrected by micro strengths actuators*
- *No “grid effect” on the laser beam*
- *Very high linearity (>99%)*

## 1 - Description

HIPAO is an ISP System’s concept for active mirror for laser wavefront correction

The AME (micro strength actuators) applies correction strengths on the initial shape of the mirror in order to obtain the best wavefront generation as possible. The AME also allows the correction of manufacturing mirror defaults and laser beam aberrations.

### Advantages of ISP System’s Active Mirror HIPAO

- Less hysteresis than piezo-actuators (from 10% to 0.1%)
- No “grid effect” due to mirror discontinuities and often observed with piezo-actuators
- Astatic floating head of the  $\mu$ AME actuator ensures a ball joint connection to the mirror without friction
- Soft mirror pads delete local prints on the mirror
- AME disposed all along the mirror compensate the manufacturing low space frequency mirror’s defaults and laser beam aberrations
- Long-term high stability (no drifting)
- Focalization stability without power supply (mechanic irreversibility of  $\mu$ AME actuators)
- Very high immunity against electromagnetic perturbations during experimentations (no power supply)
- Open loop motion control (sensor only necessary during shape set up)

## 2 - Features

Features of deformable mirror vary dramatically depending on the kind of experiment. Because we are always interested in advancing new/existing technologies to satisfy market needs, we're always looking for new applications. Please don't hesitate to contact one of our representatives to discuss about your specific requirements.

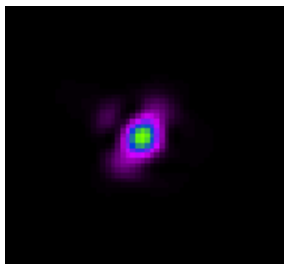
**HIPAO's specifications are defined according to customer's request.**

- Mirror diameter : from 40mm to 300mm
- Wave front error corrected by micro strength actuators (AME)
- Pitch 6 mm to 50 mm
- Force +/- 3 N to +/-50 N
- Residual shape error : less than 0.2 $\mu$ rad RMS
- Long term stability : up to 0,1  $\mu$ rad

## 3 - Quality of correction

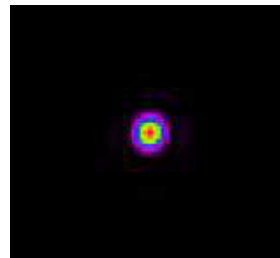
### Before correction :

46nm RMS, 446nm PtV  
Strehl report 59% (Good quality beam)



### After correction :

14nm RMS WFE (2nm RMS surface), 73nm PtV  
Strehl Report 93%



*"Best result noticed on laser chain, all technologies of active mirror confounded" From CELIA*

## 4 - Rack de contrôle

### 19" rack includes

- AME actuators controllers with integrated microcontroller and power driver
- Communication from a PC
- Power supply

Each actuator controller includes an algorithm of movement with a mathematical grading of each actuator.

A dedicated S/W can also be supplied providing control of each axis from a 19" rack PC.



 **ISP SYSTEM**  
Z.I. de la Herray  
65500 VIC-EN-BIGORRE – France

 +33 (0)5 62 33 44 44  
 [contact@isp-system.fr](mailto:contact@isp-system.fr)

 [www.isp-system.fr](http://www.isp-system.fr)

Capital de 1 000 000 € - SIRET : 410 675 078 00027 – APE : 71128 – TVA : FR 19 410 675 078