

## How to align VEGA on CHARA

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Reference: VEG-PRO-020

Version: 8

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**Approved by:**

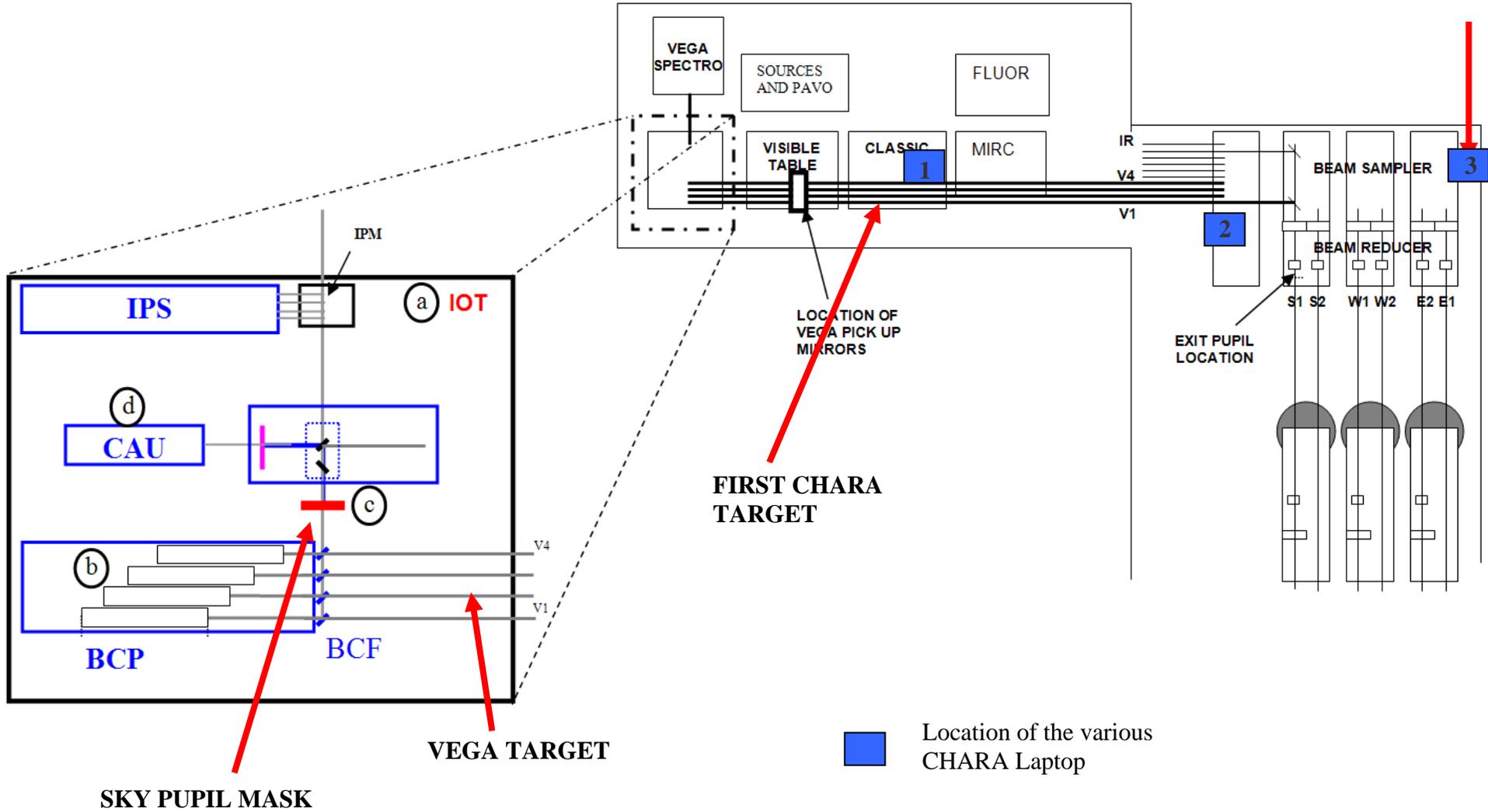
D. MOURARD Principal Investigator
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# VEGA

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## SECOND CHARA TARGET



## Preparation

1. In the CHARA Control Room, log in on pc-ctrlvega
  - With the “RDP ICS” shortcut, log in on pc-icsvega. Then start the Instrument Control Software with the shortcuts on the desktop: **ICSVEGA**. Wait for the end of the init sequence on ICSVEGA. When done, close the Remote Desktop Connection window.
  - Use the **StartIcs** shortcut to open the ICS GUI. Click on “**Get Config**” and then select the Laser Diode in the **Type of Sources** widget, set **Control Unit** to “Up to Spectro” and the **Calibration Unit** to “Down: Calib&Align”. Then click to “**Send Config**”. You are now ready to check the VEGA alignment.
2. In the corridor of the optical lab
  - ✗ Check the chiller temperature (around 5°C) and the water level.
  - ✗ Check the detector’s temperatures (-27°C for the red +5°C for the blue)
  - ✗ These temperatures are reached in about 30mn after the starting point.

## Control of VEGA-CHARA Alignment

1. Use the neutral density 3 located near the entrance hole of the spectrograph to check in the spectrograph eyepiece that the laser beams are almost illuminating the slit.
2. Install the sky pupil mask at the output of the CSM and before the BCF. Check the correct lightening of the mask by looking directly at the mask from the spectrograph entrance and check its correct location on the three adjusting pieces fixed on the table.
3. Install the target at the output of the BCPs behind the BCF. Check alignment of the four beams and adjust if necessary the M6s mirrors. If a global shift appears, first check that the target is well positioned, then try to minimize the errors by using the plane mirror behind the BCF. Finally move the M6 mirrors slowly to adjust the position. One can do that manually directly on the mounts but it’s better to use the remote controls. From any computer in the lab, log on pc-ctrlvega and start “**m6Server**” application. Then start “**GuiM6**” client on pc-ctrlvega or use the application **M6Control** on pc-icsvega on the vega screen in the lab.

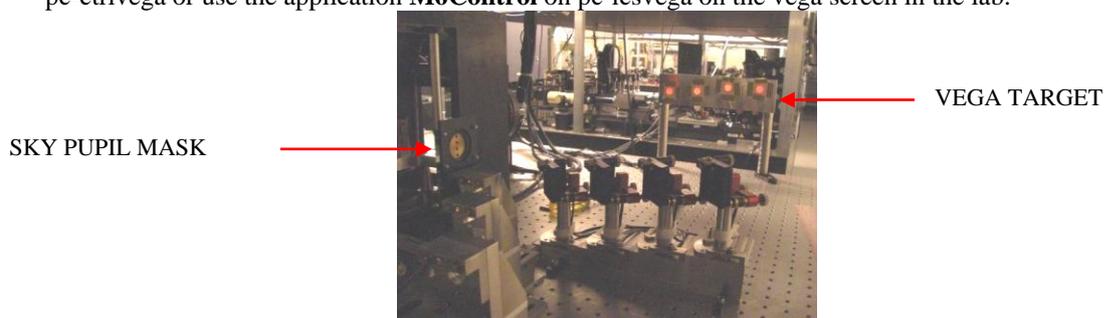
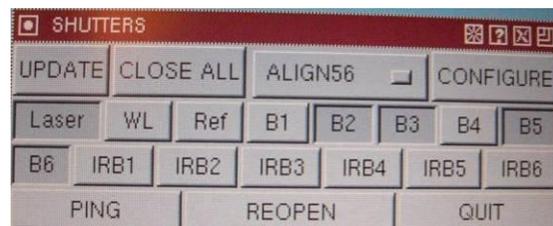
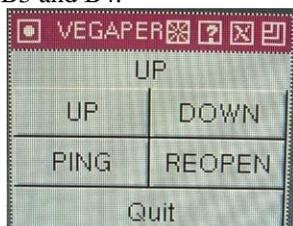


Figure 1: beams on the target behind the BCF

4. Remove the target.
5. Switch on the XPICO6 Control Box (on the cover above the periscope itself). Use one CHARA laptop. With a left click on the screen, select the interfaces VEGA PERISCOPE and SHUTTERS if they’re not already exist. The following window appears. Use the buttons to send the periscope “DOWN” and open the shutters B1, B2, B3 and B4.

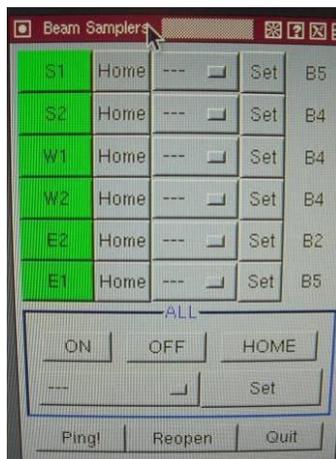


**Figure 2 : interface for periscope (left) and for shutters (right)**

6. Install the FIRST CHARA TARGET on the CLASSIC table. The beams are reflected by the periscope and are seen on the FIRST CHARA TARGET (on the CLASSIC table). This step intends to check that the periscope is correctly in position. At this level it is not necessary to adjust things. Remove this target.

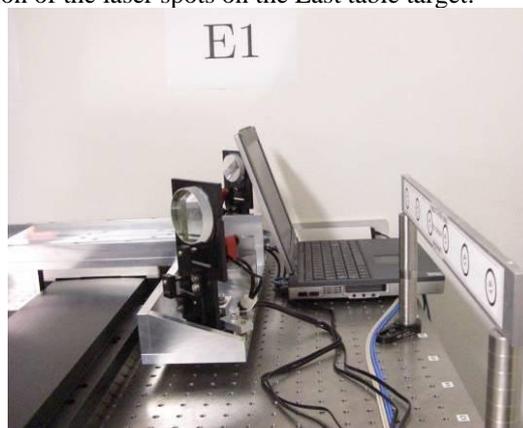


7. On a CHARA laptop, select the “BEAM SAMPLER” GUI (see Sect. 7). Use the information of the right column to configure each of the beams on their current position (memory of the position in fact). Then in the “ALL” box, select B5 and click on SET. All the beam samplers are sent to the B5 position so that the laser could be seen on the East table CHARA target.



**Figure 4: interface for beam splitters and picture of the beam splitter**

8. Check and adjust the position of the laser spots on the East table target.



For this you should use the laptop and use the small magnifying optics to correctly view the diffraction pattern. The centering of the spots is done with the Periscope mirrors M2 by using the XPICO6 interface. To have this interface, just do a left click on laptop (the windows on the left appears), then go on PicoController then in PICO GUIs #6. The window P6 appears and you could then select the periscope beam x PERIBx. Click on MOVE. The motions could be done either by clicking on the buttons or by using the keyboard arrows.



9. Come back on the close target and check the position of the spots. Usually they are ok and nothing else has to be done. In case of a decentering do the following procedure
  - a. By carefully moving the bottom mirror of the periscope (use the dedicated tools for that) amplify the decentering by a factor about 5 on the close target.
  - b. Remove the close target and adjust the position on the far target as in step 8.
  - c. Iterate until you are perfectly centered simultaneously on the far and close target.
10. Use again the Beam Samplers interface to send the dichroics at their previous recorded positions (step 7), so that the selected telescope's beam is sent on the correct VEGA beam.
11. When done, remove the SKY PUPIL MASK in the VEGA Interface Optical Table and put it close to the mechanical support of the CSM, out of the beams!
12. Check that all the covers are correctly at their position.
13. Turn off the light before leaving the lab.
14. Inside the lab: Tables
  - ✘ When back in the control room, go to the ICS GUI. Click on "Get Config" and then select "No Lamp" in the Type of Source widget. Then click to "Send Config". Close the ICS GUI.

## **Control of VEGA internal reference alignment**

It is sometimes necessary to define again the reference positions of the images and pupils in the Technical CCD detectors. This has generally to be done once a year. This operation is done remotely from the control room.

1. Set the ICS with the Laser Diode, the CAU and IPM Down, the CAU Neutral Density to 5, Neutral Density 2 on the Image CDD and Neutral Density 0 on the Pupil CCD.
2. Use the GUI TECHCAM in order to obtain a measurement of the errors.
  - a. POWER ON IMG, POWER ON PUP
  - b. LIVE and GET IMAGES.
  - c. If necessary increase the gains.
3. The errors have to be added to the current values in the file XYRefPupIma.txt on PC-ICS (c:/DevVega/TECHCAM\_CurrentVersion). Use the file XYRefPupImaReadMe.txt
4. Close the application TECHCAM and start it again to verify that the errors are now close to 0.