

Meeting DATE: 11/28/11

Present: Ernest Croner, Jack Davis, Richard Dekany, Jennifer Milburn and Sergi Hildebrandt.

REPORT WRITTEN: 11/29/11, Sergi.

PREVIOUS MEETING: 11/04/11

The main news is that TMAS has been granted with two nights in early June 2012.

That month is a very busy month at Palomar, P200, which in turn implies a tighter schedule for the integration of TMAS. In summary:

- **First light of TMAS:** The nights of June, 2nd and 3rd.
- **TMAS in full instrumental operation at Palomar:** By March 15th.
- **TMAS ready to be ported:** March, 1st.

Therefore, for February 3rd, there should be a working model in the lab, up to improvements in data processing software and tests of the ADC. But, the instrument, the RAC, the control software, the filter wheels and the ADC, including its control software, should be ready by February 3rd.

The following areas summarize the different working tasks:

- Optical design
- Optical elements
- Camera(s) electronics and optical control
- Control software
- Real-time processing software
- Lab tests

Each step means as of today (11/29/11) -see **Actions** at the end for a task list:

Optical design

Richard has a pretty definite optical design. The design can be further improved to give better image quality in the field farther way from the center. However, for the 10 mas pixel scale, it is good enough for the 15 arcsec closer to the center of the image. Thus, it is enough for the scientific program in June 2012. To be posted in the twice.

Optical elements

This means:

Lenses: Are all of them available?

Dichroic: Is it available?

Filter wheels: There are two. The controllers need to be found.

Chronograph: dimensions? As a Filter wheel? Just because the mechanical design can be tight at this point.

ADC: Are the prisms in the lab, the ones to be used? Has Richard its specs? Needs to be aligned and tested in the lab. Control system will be similar to RoboAO ADC, but Controllers? Tilt motion? Shall we consult for this issue with Chris Shelton at JPL?

Camera(s) electronics and optical control

This means:

2 sCMOS Neo cameras: connectors (USB?), card?, power supply, leave room for hose pipes from cooling system.

1 sCMOS + 1 IXon 888:

change of interface panels?

Length of the iXon 888 cable to its PCI-E card: camera to RAC. Take into account that the iXon 888 camera will be in Cassegrain focus (confirm which camera will be the one to be replaced).

Other connectors, please check with RoboAO design and propose queries for the sCMOS camera.

Control software

Contact Gregg Hallinnan for specs on control software (OSs, memory requirements, USB?, etc).

Review RobOAO control software design (it comes from the Vendor Linux/Windows).

Integration of control software into the control computer in the RAC.

The control computer in the RAC will be the Stargate with GPU. ?

Communication with the control room?

Computer to be use din the control room?

External disks to bring back the data? Necessary or the internal disks in stargaze will be enough?

If 5 hours at 100 Hz, with 2k x 1k images, one would have 2,000,000 images per night. Each image is 4 Mb. Therefore, a

maximum of 8 Tb/night would be the maximum. The scientific program has to be adapted to the memory available for those two nights, 4 Tb?

Real-time processing software

Accurate time stamps: GPS? Internal clock? Having June, first-light, campaign in mind.

Communication with the control room. Saving and processing?

Computer in control room to visualize the results.

Control from room computer of the processing parameters (frequency of selection, selection of guiding star, pointer to central region? If in time, metric for selection: brightest pixel, wavelet.

Lab tests

Bench + RAC position in the lab. How long is TMAS -Bench dimensions and light source for tests.

Closure (temperature/air/ check with PPP)

Illuminating source (not attached to TMAS instrument, but within the enclosure.)

Computer room -same as for Palomar?

Interaction with PPP for GC masks and real time data processing.

Actions:

Richard Dekany:

- Set the final optical design for June 2012. Important for Jack to have final dimensions.

Jack Davis:

- Mechanical design from the optical design.
- Filter wheel controllers?
- ADC prisms holder?
- Other questions: upside down?

Ernest:

- Panels for the two cameras configurations (2 sCMOS Neo/ 1 sCMOS Neo and 1 iXon 888)
- Cable from iXon 888 to RAC
- Power supply for cameras, filter wheels controllers (2), ADC.
- Cooling system to be clarified by Sergi. But leave room in the panel, as was already considered in RoboAO, for the water pipe. (check documentation of RoboAO). All but for the sCMOS Neo cameras is the same architecture as the one of these components found in RoboAO.

Jennifer:

- Get specs for the control software of the 2 sCMOS Neo cameras from Gregg Hallinan.

- Get Stargate in the lab and install it in the RAC (Sergi, Ernest?)
- Think about a room computer to communicate with stargate? (see Sergi's actions)
- real-time software with Sergi. First loading: sw available already (ds9?).
- Support for porting the ADC control software and others to Stargate (from Sergi)

Sergi:

- Check with Richard the questions regarding the optical elements.
- Check with Richard which camera is in focus (the one aligned with the main beam, I guess).
- Check with Richard if Jennifer has access to TMAS twiki?
- What has been purchased? (Optics/controllers?)
- Check Jack has the dimensions of the cameras.
- Filter wheels: in the lab.
- Check Jack receives the optical design and there is room for a chronograph (if possible).
- Check Jack has the dimensions of the ADC and dichroic.
- Controller for the filter wheels (2). What in RoboAO? Can he check it?
- Check with Jack the lab testing. Closure (temperature/air/check the practical solution with PPP. I may talk with Roger too for some material support). Input light source? ADC alignment facility? (once the control software is integrated in the RAC?)
- Ask Ernest what has been bought: controllers? Which?
- Check with Ernest the items before about camera control and panels.

- Let him know about the cabling for the control of the sCMOS cameras (USB?)
- Any other business.
- sCMOS Neo camera software control: give her Gregg's email and camera model.
- Check with Jennifer the memory available for saving data.
- Check how many images can be loaded for on-line processing, from 5 Hz to 100 Hz, from 1k x 1k to 2k x 1k. Take into account that there are two cameras.
- Is it possible to use pointers to only center the on-line processing in the central region? (as an option)
- Real-time software should also be used to check focus on each camera. Is the communication between Stargate and the control room fast enough? (I guess so if we use multiplex USB connection?)
- Check requirements for a computer in the control room: Control software of the cameras: sCMOS -USBs/iXon888-PCI-E Card. In Stargate and mirrored to the control room or from the control room?
- Can we get/borrow one room computer for the lab? It needs enough USB ports (2 at least for external disks, 2 for mouse and keyboard and the ones to communicate with Stargate). Some the card?
- Can it be the same for Palomar?
- Check with Reed the porting of the ADC software.
- Overall supervision and support.