

## Valencia Discussion Notes

This document is a summary and list of actions from the RIA-funded CanariCam Valencia workshop in July 2013. It represents the points that the group made during the final discussion session at that workshop, and is meant for the RIA, for the GTC directors, and the GTC Users Committee (GUC).

### Summary/Actions

1. There appears to be ~5 papers on existing CanariCam data that are in production, and could reasonably be expected to be in-press by the end of 2013. This should be encouraged.
  - a. The group felt strongly that CanariCam on the GTC has a unique and powerful niche, and remain convinced of the need for the GTC/Canaricam system to advance various science areas.
2. During the meeting and discussion, the issue of precipitable water vapor (PWV) achieved much attention. Below find the reasons and arguments that should lead to a modification in the classification categories used by the Spanish CAT concerning the PWV requirement. The CAT formulary should be changed taking into account the real PWV values and classifying the nights accordingly.
  - a. There is now CanariCam data-supported evidence that both imaging and spectroscopy in the N-band suffers little from reduced sensitivity for PWV values as high as 10mm or perhaps a little higher. This was supported by experience voiced by Pat Roche (Oxford).
  - b. The single most significant impediment to executing CanariCam observing blocks is the PWV requirement the PIs are using. If this were relaxed, significantly more data throughput is expected.
  - c. There is likely community understanding that a PWV of a few mm's is necessary to obtain high-quality N-band data. This could be due to the CAT form (where the selectable PWV is (a) <1.5mm, (b) 1.5-3mm, or (c) any), or some other literature that can be found on the ORM through a Google or literature search. It looks like a PWV of 3mm is very rare for the ORM, and we suspect that many put 3mm as a default 'middle' option.
  - d. The GTC's PWV monitor data shows that the average PWV over the past year or so, and split into seasons is higher than 3mm (much higher in summer).
  - e. We feel that it is crucial to educate the community that a PWV of >>3mm does not impede the acquisition of N band data. Moreover, given the above, it is actually necessary to obtain data, which in fact will be of rather high quality. This should be an active process through contacting CanariCam proposal PIs, as well as via the GTC WWW page to ensure their accurate knowledge of this new datasets and the clear implications.
  - f. An additional point to bear in mind in that the PWV statistics has to be convolved with the number of usable nights (useful time) to get the real

number of observing hours with a given condition. For example, although PWV values are better (lower) in wintertime, the actual useful time is lower. The opposite happens in summer.

- g. We as users can take a role to help communicate with the broader user PWV community, so they can also benefit from this new information.
3. It should be noted that the major factor affecting changes in sensitivity is the GTC delivered Strehl, rather than the PWV (to the limit in 2a). Furthermore, the sensitivity of the instrument is a strong function of the image quality. However, fast guiding remains a key missing GTC capability for high quality CanariCam data. The science niche of CanariCam on the GTC is that of spatial resolution. This is, actually the advantage over space, which otherwise offers sensitivity, and this is so for the most basic and widely used modes of operation (over a broad range of science). Only through fast guiding will the image quality, and crucially image quality stability, realize the full potential of that niche. We urge the rapid implementation of fast guiding on the GTC, and note it's fundamental basis to future GTC developments such as AO.
4. There is a worrying paucity in the rate at which CanariCam data is being acquired and delivered, even for approved programs with high scientific value. CC science observations should be a real priority for observations, even above commissioning of additional modes. We encourage the GTC to help users set realistic expectations. Accepting many programs demands significant work and attention from them, and raises their expectations, which are not met, as the completion rates remain low.
5. The main opportunity to exploit Canaricam on GTC arises in the next few years, prior to the launch of JWST. Until then, Canaricam offers the highest resolution and sensitivity of any mid-infrared instrument, as well as some unique capabilities. As more instruments are deployed at GTC the pressure on observing time will increase, and so it is vital to demonstrate the science performance and productivity now and exploit the instrument's potential.
6. Some GTC CanariCam WWW pages use resources hosted at the Gemini Observatory, such as the MIR resources page, some standard star location scripts, IRAF, etc. We urge the GTC to make static and/or 'mirror's of those extremely useful resources so that the reliance on Gemini is reduced or eliminated. This is especially important once Gemini has decommissioned TRecs.
7. A private data reduction pipeline ("Redcan") is available, but not supported. The pipeline is superior to the current IRAF-based data reduction package. We urge the GTC to enter discussions with the Redcan creator(s) to investigate if this can be supported by the GTC, and made available to the community. Some form of expression of gratitude to the Redcan creator(s) maybe appropriate as this was developed outside of the CanariCam and GTC teams as a private project.

8. In the long-term, we feel a CanariCam specific conference and data reduction workshop would be helpful.

Taken collectively, we feel the implementation of the items above will significantly advance CanariCam science and publications. The community remains solidly in support of CanariCam and look forward to exploiting the GTC/CanariCam combination.

*Prepared by the participants in the discussion held at the conclusion of the RIA sponsored meeting on 17<sup>th</sup> July, 2013*