

Jay Elias & John Glaspey

Attendees:

Todd Boroson

Jay Elias

John Glaspey

Di Harmer

George Jacoby

Dick Joyce

Knut Olsen

Abi Saha

Daryl Willmarth

Tom Wolfe

General outline of meeting –

The purpose of the meeting was to outline the constraints governing the CCD upgrades and to try to arrive at a consensus on the science criteria for selecting the specific devices.

There are 2 projects associated with KPNO – an upgrade of the Mosaic CCDs and controller, and the detector required for KOSMOS. There is a 3rd project, the CTIO Hydra upgrade, which was not discussed at length.

In principle the KOSMOS detector could also be used on the echelle or RC spectrograph if the dewar is compatible. In principle also, if the funds suffice, an additional detector could be purchased allowing KOSMOS/echelle/RCSp users a choice of detector. It is likely that purchase of the 2nd device would be deferred until it was clear that there are not other more critical needs for the funds within the ReSTAR projects – that is, it would be treated as contingency.

Most of the discussion centered on the Mosaic detectors, since selection of and procurement of these devices is likely to drive the overall schedule for the upgrade. In contrast, the KOSMOS decision should wait until there are results from the optical redesign, since the spectrograph wavelength

response and required detector area are still uncertain. (That is, there are goals but no confirmation that these can be met.)

There was general agreement that the primary motive for the Mosaic upgrade is an improvement in overall performance (QE, read time and read noise), and not a focus on a particular wavelength region. The PF corrector performs reasonably well into the UV, but not all the way to the atmospheric cut-off. (The limit of "good" performance was stated by George Jacoby to be around 350 nm.)

Various CCD datasheets were passed around or described. With the exception of some extreme-red devices, CCDs now available seem to have a ~50% QE around 900 nm at the red end, though with some variability. There are devices that have good QE down to ~350 nm, probably from all 3 vendors mentioned (STA, E2V, Fairchild). Such a device should meet the overall requirements.

It was noted that thicker devices are more affected by cosmic rays, but that these impact spectroscopy more than direct imaging (narrowband filters excepted). The precise choice of device also involves considerations of read time and read noise; advice from people attending the ESO detector conference at the time of our meeting is needed.

There may well be devices under development with even better characteristics, but it was agreed that the Mosaic schedule precludes postponing the start until something under development is developed. The comment was also made that there is always something better under development. It was recognized that the delivery times may vary somewhat from vendor to vendor (Mike Lesser doesn't have CCDs "on the shelf", for example), but it was felt that so long as the procurement times were reasonable we should go with the best choice and not insist on the fastest one.