

JAO Response to the ASAC Report

Item II.4. Use of Radar/Sonar sensing of the atmosphere. We will investigate what the capabilities and limitations of this technique are and whether it has the possibility doing either a direct correction for the dry component or improving the correction for the water.

Item II 6. Band 3 Noise Temperature. We have had intensive discussions about this within the Project. Amongst other aspects we investigated the issue of balancing the performance of the channels to optimize polarization performance. It turns out that this is a quadratic effect – e.g. having two channels where one is 10% better than the mean and the other 10% worse produces only a ~0.5% loss of accuracy in measuring the Stokes' parameters. We therefore concluded that it is more important to optimize the average noise temperature of the entire front-end rather than laying the emphasis on balancing the noise temperatures. It was also estimated that insisting that both polarizations meeting the requirements individually would reduce the yield of useable devices from 25% to 15%, which would produce substantial delays in delivery. We have therefore agreed to new specifications for the cartridges as originally proposed, i.e. <37K average at LO = 104GHz, and <41K average at all other LO frequencies, in place of 37K over 80% of the band and 61K over the remaining 20%. These figures are still at least as good as those being achieved at these frequencies by any other receiver developers. As far as the cartridge is concerned this still provides the originally specified performance for continuum observations at 104GHz (where the atmospheric transmission is good) and gives substantially better sensitivity for spectral line observations at frequencies around 86 and 115GHz which are near the band edges.

This does not, however, include the losses due to the warm optics. For the present the requirement on the additional noise due to these has been set at 2K. The measurements continue to indicate that there is a larger excess than this and this remains under investigation. There will also be noise added by the membrane that separates the front-end from the external environment and it remains to be determined whether we can replace the current rather thick Goretex material, which has relatively poor performance at this frequency, with a much thinner one.

Finally on this topic, the Project has agreed to work with UVA on producing more and, if possible, better wafers to ensure that there are sufficient to cover the full production run of Band 3 cartridges and to make sure that the performance is as good as possible.

Item II 7. Configurations. Additional fibres have been included in the layout to allow extra pads to be added at intermediate baselines and also for some extension to longer baselines.

Charge 1: Software. The External Review has now taken place. The verbal feed-back was positive in that the panel did not see any show-stoppers in the software design and development. The panel did however have many detailed comments and there will no doubt be a number of significant recommendations in their report.

Charge 2. AIV/CSV. We are already moving into the technical building at the OSF. A revised plan for the use of lab space has been agreed which will keep the delays to a minimum.

Schedule and Milestones. The Board discussed this topic in detail. The ASAC is requested to comment on the attached revised set of milestones. This should be discussed at the next telecon. Meanwhile work on a revised schedule is still going on. The initial reappraisal, taking account of known delays in deliveries and including a realistic contingency, indicated a date for the start of Early Science of Oct 2011, which is too late. We are therefore reworking the plan to see what work-arounds can be put in place to avoid the delays caused by late deliveries. We hope that the commissioning and therefore early science can be brought forward by several months. The ASAC will be kept informed.