

HIRES Dewar Upgrade

Project Monthly Report – Feb20/4

Progress

Detectors

CCD 17-7-6 has been in dewar 7 for over a week with the purpose of doing QE measurements on a daily basis and then evaluating the stability of the QE. A plot of QE with curves showing about a 2% increase in the UV QE (4500A) on a daily basis is attached. Even though by eye the CCD looks virtually clean, i.e., no BG, there appears to be something happening to the CCD that is producing this variability in the UV QE. In the next day or so a QE measurement will be made followed by heating the CCD and doing another QE measurement. The expectation is that the QE will return to the value it was when originally installed in the dewar.

Dewar 7, CCD and associated parts were cleaned as per current procedures before 17-7-6 was installed. The CCD was then subjected to the standard O2 soak with the caveat that after the 4 hour heating part of the process, the zeolite canister was reinstalled. We have subsequently found that O2 is not adsorbed by the zeolite and that this step is unnecessary for dewar 7 or for the Hires dewar. The zeolite charge will now be installed in the dewar before the O2 soak procedure.

There are several tests planned to determine the cause of the QE instability. It may be that the rate of diffusion across the o-rings is sufficient to cause the BG to form.

In parallel with this activity, the Hires dewar will be cleaned as per procedures and then reassembled for testing (~2-3 weeks).

The new CCD lab RGA has been tested in the clean-room dewar at the same time the LBNL RGA was active for comparative studies. The results are that both RGAs show the same level of partial pressures for all species selected. This means that all of the RGA tests performed in the past with the LBNL instrument are valid. The LBNL RGA will be returned within a few weeks.

Software

The CCD controller code for reading out the CCDs individually is being written and will be tested when the engineering array is next installed in the dewar. The remainder of the software will not be developed as part of this project.

Issues and Concerns

The contamination issue and its resolution remain the most significant problem for this project. Until a resolution is determined, and meaningful schedule is not possible.

Schedule

The Pre-Ship review, shipping, installation and commissioning schedules are delayed pending resolution of the contamination problem in the dewar. The earliest installation date is in August.

Budget and Spending Profile

To the end of January the project has spent \$793,091 or 97% of the project cost estimate, not including contingency. A summary of the budget is attached. We expect to over spend the budget, including contingency, but have no plans to bill beyond the total agreed to price, which includes contingency.