**NSLS MAP DAC 2015 Annual Report**

**COMPRES Facilities Comments**

**Andy Campbell**

**Bin Chen**

**Kanani Lee**

**Mark Rivers**

**XPD multianvil**

The NSLS multianvil program was very strong, with innovative developments and a strong publications record. At NSLS-II the high-pressure program is guaranteed only 20% of the time, with the possibility of additional time from the GU program.

Major effort in the last year was decommissioning of the NSLS beamlines, removing all of the equipment and materials.

Commissioning is planned for late 2016, first users in early 2017.

A future possible home for high pressure is the proposed HEX beamline. This would be a superconducting wiggler similar to X-17. It could have 3 simultaneous stations. However, it is being funded by the New York Power Authority, which does not actually do scientific research. Who will have access to HEX and on what terms is not known at this time.

The site visit in September 2015 recommended that the partner user agreement be renegotiated to be more favorable for COMPRES, and similar to the XFM agreement, for example. The report also recommended that the multi-anvil program continue to be supported by COMPRES.

**XPD diamond cell**

The NSLS X-17 diamond cell program was not competitive with beamlines at the APS at the end of its life. It lacked online laser heating, had a larger focus, and a smaller intensity on sample. The XPD damping wiggler is not an optimal source for a brightness-driven experiment like DAC diffraction, because the source brightness is 10X less than an APS undulator in the 30-40 keV region used for these experiments.

At the time of the site visit there was a pending NSF MRI proposal that was focused on the DAC program. This was not funded. We were told that NSLS-II then agreed to fund the K/B mirrors.

The statement that the proposed upgrades at existing synchrotrons will shrink the beams to sub-mm is simply not true. The size of the x-ray beam does not substantially change, it is the size of the electron beam source that is is shrunk, increasing the brightness.

All of the planned high-pressure sources in their vision are wigglers. These are simply not optimal sources for experiments requiring small beams, compared to undulators on high-energy storage rings.

Who is going to fund the support lab that they say is critical for high pressure at NSLS-II?

The site visit did not find a reason to overturn the previous Executive Committee recommendation to withdraw support for the DAC program at XPD. They did list 6 conditions that would have to be met to justify support for a DAC program at XPD.

The Year 5 proposal for the NSLS-II program has $83K for the DAC beamline scientist, plus 45% fringe + 26% indirect. This can be eliminated.

In Weidner’s response to the site visit report he says that the entire XPD agreement can be in danger if COMPRES does not support the DAC. Is there really a reasonable chance of this?

**6-BM multianvil**

Facility is coming online, first few outside users have run.

Puzzling why they feel they need to build their own support laboratory, when GSECARS has a well equipped support lab that they could have used and helped to support.

Haiyan Chen is trying hard to make the APS beamline work. In her report she lists 5 publications. Only one has any earth-science relevance.

**Dan Shim**

• Where do the stuffs decommissioned go? "We estimate a start of the commissioning of the high pressure program at XPD-D in summer of 2015 and a full user operation starting in November 2016." status now? Also "While the beamline development at NSLS II is on hold, we focused on further development and commissioning of the pressure and temperature generating devices." Confusing. If the beamline development is on hold, where do they actually install the instruments?

• Many if not all projects in personnel report for x17 DAC program are non earth science. And even non compres users?

• "Sintered diamond anvil purchase". What is this for?