

Upgrades to the B21 solution SAXS beamline

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B21 is a solution state SAXS beamline at the Diamond Light Source synchrotron in the UK. Over the past two years we have carried out a series of upgrades that have resulted in noticeable improvements in data quality and throughput.

We have:

- 1) Upgraded our monochromator and focussing optics resulting in a 50x increase in flux and improved focus. This upgrade has reduced average exposure times by around 12x whilst improving signal to noise.
- 2) Moved the silicon nitride window that separates the high vacuum of the optics from the low vacuum of the sample area further from the sample and added a set of custom slits close to the sample. This has dropped background scattering further improving signal to noise.
- 3) Improved software integration of our HPLC-SAXS setup and created useful tools for analysis of this kind of data.
- 4) Developed a successful mail-in program for remote measurement of samples at the beamline.

Here, we present details of the upgrade program and the current state of the beamline and highlight some recent science applications.