

Science under non-ambient conditions using Advanced Light Source (ALS) beam at Beamline 12.2.2: New developments and existing techniques

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The 12.2.2 superconducting bending magnet beamline at ALS has been dedicated to angular dispersive x-ray diffraction (XRD) measurements using a brilliant X-ray beam under non-ambient conditions since its commissioning in 2004. The beamline offers two end-stations operable alternately to perform single crystal and powder diffraction experiments under various non-ambient conditions, such as high pressure, high temperature and controlled gas flow. Currently, our facility allows researchers to study a range of materials at nano- and atomic-scales with very diverse scientific interests from structural determinations to probing chemical reactions.

This talk will be mainly focused on how we address our users' demands with state-of-the-art instrumentation at 12.2.2, and will include some science examples from our in-house research and user community. In addition, I will also mention how the upcoming ultimate storage ring upgrade (ALS-U) would affect the user program and science program at 12.2.2. Current projections foresee a one-year dark period starting in about 2-3 years, and the upgraded machine will produce a steady, highly-focused and at least 100 times brighter beam.

