



Contribution ID: 187 Contribution code: WEP60

Type: Poster Presentation

## Survey and alignment of beamlines for Advanced Photon Source Upgrade

*Wednesday 17 September 2025 17:00 (1 hour)*

As part of the Advanced Photon Source Upgrade (APS-U) Project, all 72 beamlines needed to undergo alignment to the new storage ring installation. Prior to beginning the alignment efforts, beamline geometry files were to identify the location of components with respect to the beam source. For new beamline installations, the remaining process was simpler. New components were fiducialized in a lab, along with their support tables. Tables were then installed and aligned to the beamline geometry configuration and a final report was generated for approval. However, for existing beamlines, the process was more intricate. Fiducial records dating back to 1996 were used to generate fiducial files. However, some information was lost over the years. In response, new techniques were implemented to fiducialize components missing records in-situ to avoid removing components from the beamline. Existing component positions were measured with respect to the new source, then realigned. A report of pre-alignment and a report of realignment were generated for approval. All beamlines have undergone realignment in one year timeline and successfully gone through commissioning process.

### Footnotes

### Funding Agency

This research used resources of the Advanced Photon Source, a U.S. Department of Energy (DOE) Office of Science user facility at Argonne National Laboratory and is based on research supported by...

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**Session Classification:** Wednesday Poster Session

**Track Classification:** NEW FACILITY DESIGN AND UPGRADE: Quality Assurance and Tracking