Contribution ID: **453** Contribution code: **MOXP02** Type: **Invited Oral Presentation**

APS upgrade: Commissioning the world's first light source based on swap-out injection

Monday 11 August 2025 09:30 (30 minutes)

The Advanced Photon Source (APS) has recently completed a major upgrade, replacing its 25-year-old storage ring with a cutting-edge hybrid seven-bend achromat lattice enhanced by six additional reverse bends. The new design achieves a natural emittance of 42 pm-rad, enabling the production of X-rays up to 500 times brighter than those generated by the original APS. A key innovation of the upgrade is the implementation of a swap-out injection scheme, which replaces entire depleted bunches instead of performing traditional top-up injection. This approach enables on-axis injection to accommodate for the reduced dynamic aperture resulting from strong focusing. This paper outlines the commissioning process, shares initial operating experience with swap-out injection, and presents performance data for new systems such as the bunch-lengthening cavity.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

Work supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357.

I have read and accept the Privacy Policy Statement

Yes

Author: SAJAEV, Vadim (Argonne National Laboratory)

Co-authors: BRILL, Adam (Argonne National Laboratory); YANG, Bingxin (Argonne National Laboratory); RAFAEL, Fernando (Argonne National Laboratory); SHEN, Guobao (Argonne National Laboratory); Mr BUI, Hahn (Argonne National Laboratory); SHANG, Hairong (Argonne National Laboratory); DOOLING, Jeffrey (Argonne

National Laboratory); Mr CARWARDINE, John (Argonne National Laboratory); CALVEY, Joseph (Argonne National Laboratory); HARKAY, Katherine (Argonne National Laboratory); EMERY, Louis (Argonne National Laboratory); SMITH, Martin (Advanced Photon Source); BORLAND, Michael (Argonne National Laboratory); KELLY, Michael (Argonne National Laboratory); Mr ARNOLD, Ned (Argonne National Laboratory); KUKLEV, Nikita (Fermi National Accelerator Laboratory); MOHSEN, Osama (Argonne National Laboratory); Mr SOLIDAY, Robert (Argonne National Laboratory); LINDBERG, Ryan (Argonne National Laboratory); Mr FORS, Thomas (Argonne National Laboratory); BERENC, Tim (Argonne National Laboratory); WIENANDS, Uli (Argonne National Laboratory); CHENG, Weixing (Argonne National Laboratory); SUN, Yine (Argonne National Laboratory)

Presenter: SAJAEV, Vadim (Argonne National Laboratory)

Session Classification: Monday Plenary

Track Classification: MC0 - Plenary Speakers