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Alignment Strategy for APS Upgrade

The Advanced Photon Source (APS) at Argonne National Laboratory is a 7GeV third generation light source providing X-ray beams for research to scientific community since 1995. In order to remain the world-leading synchrotron radiation facility in the western hemisphere, delivering X-ray beams of high-brightness and high-energy is critical. In 2013, the Department of Energy (DOE) identified the national need for the APS Upgrade (APS-U) project. Currently, the detailed preliminary design is under development to replace existing APS storage ring with lattice incorporating multi-bend achromat (MBA) technology. The extremely strict alignment tolerances in combination with very aggressive installation schedule pose unique alignment challenges. The geodetic control network configuration, design of magnet support and alignment systems, magnet mapping and fiducialization, as well as alignment strategy for assembly, testing, and installation in the APS storage ring are discussed.

Summary

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