Beamline optics design and characterization for the APS upgrade

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The Advanced Photon Source Upgrade (APS-U) project includes the construction of new beamlines as well as improving existing beamlines to benefit from the significant beam enhancement in brightness and coherent flux. The success of these beamlines relies on the design and manufacture of start-of-the-art X-ray optics that are wavefront preserving. In this contribution, we overview the simulation [1, 2] and characterization tools [3-4] developed at the APS to support various activities in beamline design and optics R&D. Utilizing these tools, we study the effects of thermally induced aberration and mechanical vibration of optics on the beam coherence and wavefront quality. The results can provide guidance for the beamline optimization and help the optics specification.

References

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