



Memo

Date: August 20, 2017
To: Mark Breitfeller, Frank DePaola, Mohamed Benmerrouche, and Sushil Sharma
From: Zhong Zhong (chair), Photon Science Radiation Safety Committee
Subject: Review of the ray-tracing designs of the XFM (4-BM) and QAS(7-BM) front-ends

Dear Mark, Frank, Mo and Sushil,

The Photon Science Radiation Safety Committee (RSC)'s ray-tracing subcommittee concluded review of the front-end ray-tracing drawings of the XFM (4-BM) and QAS(7-BM) front-ends on August 18.

Subjects reviewed include the synchrotron max-fan and Bremsstrahlung drawings. Since the max. fan drawings are sufficient for assuring the safety of the front-end against synchrotron radiation, the nominal synchrotron ray-tracings, included in the drawing packages on sheets 2 and 3, were not reviewed by the RSC.

Written documents

The following documents were submitted to the RSC on July 17, 2017 for review:

1. QAS front-end assembly drawing, SR-FE-3PW-4001, Rev. B by J. Tuozzolo.
2. QAS front-end Bremsstrahlung ray-tracing, SR-FE-3PW-4001, Rev. B, sheets 6 and 7 for horizontal and vertical projections, respectively.
3. QAS front-end max. synchrotron ray-tracing, SR-FE-3PW-4001, Rev. B sheets 4 and 5 for horizontal and vertical projections, respectively.
4. XFM front-end assembly drawing, SR-FE-3PW-6001, Rev. B by J. Tuozzolo.
5. XFM front-end Bremsstrahlung ray-tracing, SR-FE-3PW-6001, Rev. B, sheets 6 and 7 for horizontal and vertical projections, respectively.
6. XFM front-end max. synchrotron ray-tracing, SR-FE-3PW-6001, Rev. B sheets 4 and 5 for horizontal and vertical projections, respectively.

Notes

XFM and QAS both use three-pole wiggler as x-ray source. The masks of XFM and QAS in the front-end use standard 3-PW mask design that incorporates cooling fins which enable the masks to be passively safe even without cooling water. XFM is similar to CMS (no mirror, 3-PW as source), and QAS is similar to BMM (single mirror, rising reflection angle, 3-PW source). Both the CMS and BMM front-ends have recently been reviewed by the RSC ray-tracing sub-committee and have since been successfully commissioned.

Conclusions

Based on our assessment of the ray-tracing drawings, the RSC finds the Bremsstrahlung and synchrotron shielding designs for the front-ends of both the XFM and QAS beamlines meeting the NSLS-II shielding policy.

Radiation Safety Committee

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