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Radiation dose mitigation for APPLE-X electronics at the European XFEL.

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An afterburner consisting of four APPLE-X undulator modules has recently been re-installed downstream of the planar undulator in the soft x-ray beamline (SASE3) at the European XFEL. The modules were removed shortly after initial installation because of damage to electrical components caused by the spontaneous radiation produced in the planar undulator. After the damage became apparent, a study was carried out to investigate different schemes for protection of the electronic components from the planar undulator radiation. Based on the results of this study, extra synchrotron radiation absorbers were added at selected locations in SASE3, and the APPLE-X modules were re-installed. Subsequent measurements showed a significant reduction in the levels of radiation impacting the sensitive electronic components. This paper outlines the model used for the radiation simulations, presents the results of the validation of the simulations against measurements, and compares some of the different methods that were considered for protection of the sensitive electronics. Recent radiation measurements will also be presented showing the effectiveness of the additional absorbers that were installed.

Footnotes

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