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Gamma Spectrometer Measurements at the European XFEL Undulator System

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This work presents measurements of the GR05+ Gamma Spectrometers placed in two different undulator cells of the SASE1 Undulator System at the European X-Ray Free Electron Laser (XFEL). Because of their small size, it is possible to register energy spectra near the beam pipe and undulator permanent magnets. Additionally, the characterization of this CZT solid-state detector is included, as well as the dependence of its response on the different detector orientations relative to the radiation source. It shows that for the lower energy range, the spectrometer's signal can decrease even more than 50% compared to the reference conditions. Simultaneous measurements in two undulator cells (upstream and downstream) show the difference between the radiation field in different parts of the undulator system. Simulations confirm that the radiation field in the upstream part of the SASE1 Undulator System consists mostly of bremsstrahlung radiation.

Footnotes

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