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Design of X-ray ionization beam profile monitor for Korea-4GSR

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The Insertion Device (ID) photon beam of a synchrotron can be contaminated with radiation from upstream and downstream bending magnets, causing position measurement errors in blade-type monitors. Beamlines of the low emittance storage ring are particularly sensitive to photon beam position variations, requiring more accurate measurements. To address this, we designed an ionization profile monitor to non-destructively measure the profile and position of the white undulator beam at Korea-4GSR without contamination. Leveraging the relatively large active area of readout devices suitable for small emittance beams we have designed a 1:1 mapping field to defocus photo-ions. Given that the defocusing field can induce errors due to vertical position, we propose a calibration method and validate it using particle tracking simulation.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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