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Development of White Beam Profile Monitor for Korea-4GSR

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Accurate measurement of photon beam position and profile is crucial for beamline users to achieve precise alignment and efficient utilization of the desired photon beam. In low-emittance storage rings, however, the power density of the photon beam has increased, making it challenging for conventional profile monitors such as wire scanners and scintillating screens to withstand the high power without damage. Here, we present the development of an Ionization Profile Monitor (IPM) capable of robustly measuring the photon beam position and enabling non-destructive beam profile measurement. A noble gas environment was designed to ensure sufficient ionization signal strength, and a defocusing electrode structure was introduced to fully utilize the relatively large active area of the readout system. Since the magnification induced by the defocusing field depends on the vertical position, we proposed a calibration method to correct for the resulting non-linearity. Finally, we present the results from prototype testing, including the measured position accuracy and the point spread function analysis.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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