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Complexities in Designing Front-end XBPMs for APPLE Insertion Devices for Diamond-II

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With the move to a 4th generation light source for Diamond-II, modifications to the front-end X-ray beam position monitors (XBPMs) are required to prevent damage due to the higher power loads. Several Diamond beamlines use advanced planar polarized light emitting (APPLE) undulators, which provide variable polarisation of the X-ray beam, including circular polarisation to minimise on-axis power provided to the beamline. The different transverse beam profiles resulting from the polarisations means that solutions for the APPLE-II XBPMs are a compromise between position sensitivity and risk of damage. The APPLE-Knot undulator for the I05 beamline in Diamond-II has provided further challenges in the design of the XBPMs due to the complex power densities provided by the magnetic fields present in the insertion device. Solutions found for APPLE-II XBPMs will be presented, as well as the design challenges caused by the X-ray beam profile from the APPLE-Knot.

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