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Performance of the Lancelot Beam Position Monitor at the Diamond Light Source

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The Lancelot beam position and profile monitor records the scattered radiation off a thin, low-density foil, which passes through a pinhole perpendicular to the path of the beam and is detected by a Medipix-RX sensor. This arrangement does not expose the detector to the direct beam at synchrotrons and results in a negligible drop in flux downstream of the module. It allows for magnified images of the beam to be acquired in real time with high signal-to-noise ratios, enabling measurements of tiny displacements in the position of the centroid of approximately 2 μm. A constant frame rate of up to 90 Hz is achieved. The results of measurements with two Lancelot detectors installed in different environments at the Diamond Light Source are presented and their performance is discussed.

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