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## The CirPAD, a novel circular 1.4M pixel detectors for X-ray diffraction measurements at Synchrotron SOLEIL

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The CirPAD (Circular Pixel Detector Array) is a unique hybrid pixel detector with a circular shape that has been developed by the DiffAbs beamline, the Detectors and Design and Engineering teams at Synchrotron SOLEIL, in collaboration with the Cegitek company [1]. The unique geometry combined with a very good characteristics of the XPAD3.2 readout chip results in a very versatile detector that covers a large panel of different experiments, such as materials science and physical chemistry scientific applications or time-resolved pump-probe X-ray diffraction measurements.

The complete detector is assembled from a 20 high speed XPAD modules [2] for a total of 1.4 Mpixels (see Figure 1). Each module is tilted with an angle of  $6.7^\circ$  which in total covers a  $135^\circ$  diffraction angular range, with a radius of 645 mm and a 0.01150 angular resolution. The detector has been installed on a dedicated motorized crane that surrounds the 6-circle diffractometer (see Figure 2), allowing operation in a large angular range in horizontal and vertical axes. One of the main advantages of the detector is its high-speed readout, short (gated) acquisition time and a large area that allows to reduce the acquisition times significantly.

In this work we present the main characteristics of the detector and several examples of results obtained at the DiffAbs beamline.

[1] K. Desjardins et al., J. Synchrotron Rad. (2022). 29, 180–193

[2] P. Pangaud et al., Nucl. Instrum. Methods Phys. Res A (2007). 571, 321-324

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