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P1.19: Use of the large area XSPA 500k detector for a time-resolved pump-probe-probe diffraction experiment at Synchrotron SOLEIL

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The XSPA 500k detector is an X-ray single photon counting hybrid pixel detector based on UFXC32k readout chips, that has been developed by Rigaku Corporation. The detector offers several unique features such as a seamless array of uniform pixels of 76 × 76 μm², very high-count rate, very fast readout, and an ultrashort multi-gating operation. The double-gating operation has been verified experimentally in a time resolved pump-probeprobe diffraction experiment.
Recently the XSPA detector was tested at CRISTAL beamline to demonstrate its operability to conduct such experiments (Fig. 1). A Ti3O5 powder sample was excited with femtosecond laser pulses, and its structural response was monitored with two consecutive diffraction images (double-gating). The first one, taken shortly after the pump pulse, to study the excited sample, and a second one, taken at a longer pump–probe delay hen the sample is completely relaxed. The second image can be used to ormalize the photoinduced signal on a shot-to-shot basis, thus increasing quality of the acquired data.
During the conference the performance of the detector and experimental results will be discussed and presented.

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