Fast X-ray detectors with sub-nanosecond time resolution are required for advanced time-resolved synchrotron experiments, including quasi-elastic scattering using TimeDomain Interferometry (TDI). We investigate the potential of the MiniCACTUS depleted monolithic CMOS pixel sensor for time-resolved X-ray detection at synchrotron facilities.

The pixel response of MiniCACTUS was characterized in the laboratory using X-ray sources at several photon energies. First timing measurements were subsequently performed at the SPring-8 Inelastic & Nuclear Resonance Scattering beamline using a 14.4 keV X-ray beam, yielding a time resolution of ~ 0.7 ns full width at half maximum (FWHM) with the 200-µm-thick sensor. These measurements provide a first assessment of the MiniCACTUS response to X-rays and of charge collection under high-voltage operation, demonstrating its potential for future high-time-resolution synchrotron applications.