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Ultrafast Diagnostics for Soft X-Ray Applications

Tuesday, 7 October 2025 17:45 (1h 30m)

We provide a comprehensive overview of our current line of detectors designed for soft-X-ray detection in synchrotron and laser science. We will cover a variety of detector types, including streak cameras and sCMOS cameras, highlighting their respective performance metrics, integration capabilities, and use cases in synchrotron beamlines, and laboratory setups. We also discuss recent advancements in compressed ultrafast photography (CUP), a new computational imaging technique that integrates compressed sensing with streak imaging for single-shot 2D ultrafast imaging. To prove the concept, we designed and manufactured a patterned ultraviolet photocathode and integrated it into a streak camera. This new system exhibits a sequence depth of up to 1500 frames with a size of 1750 × 500 (x, y) pixels at an imaging speed of 0.5 trillion frames per second. This system can be easily adapted to soft x-ray, showing its potential for imaging and characterization at synchrotrons.

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