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PIImMS2, a CMOS event-triggered time-stamping image sensor with storage of multiple timestamps

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PIImMS, or Pixel Imaging Mass Spectrometry, is a family of high-speed monolithic CMOS imaging sensors tailored to the requirements of mass spectrometry and related fields. PIImMS pixels each compare step events of collected charge to an adjustable threshold, storing up to four significant events inside the pixel as 12-bit timestamps with time bin durations down to 12.5ns (80MHz). The pixels may be individually trimmed to improve the uniformity of response. The pixels measure 70µm by 70µm and each contain over 600 transistors. PIImMS2 is the second generation of these sensors, providing a larger sensor area with 324 by 324 pixels and new features. We will present an overview of the pixel and sensor architecture, recent characterisation results for PIImMS2 and application results for PIImMS1 and PIImMS2.

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