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The Large Pixel Detector for the European XFEL

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We present an overview of the Large Pixel Detector (LPD), results from beam tests and the next steps and plans for future developments. LPD is a large area megapixel scale detector primarily designed for the European XFEL (XFEL.EU). At XFEL.EU the LPD detector must be capable of operating with a frame rate of 4.5MHz and record images with a dynamic range of 1:100,000 photons whilst maintaining low noise. The LPD system has a large in pixel memory depth of 512 images that can be selected with a flexible veto system. Data is then transferred off the detector head in between x-ray pulses with an accompanying high rate data acquisition system (~10 GB/s). The system is assembled from custom silicon sensors and ASICs as well as a programmable data acquisition cards and supporting electronics and mechanics. A prototype LPD system has been constructed and tested on a range of beam lines including the free electron laser, LCLS. The highlights of these tests will be reported.

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