Jungfrau Specifications

The Jungfrau is a fast, large dynamic-range X-ray camera deployed at LCLS for hard to tender X-ray in-air applications since run 15. We currently have one 0.5Mpixel camera and one 1Mpixel camera. The basic tile is a 512x1024 array of 75 um pixels made from a single Si sensor (thus no metrology correction is needed). The 1M camera has two such tiles, separated by 36 pixels. In standard operation each pixel individually selects the ideal gain range among 3 possible, allowing the camera to provide excellent single-photon response down to a few keV and a linear response up to 15k 8keV photons. In standard mode the camera noise is about 75 electrons. There is an addition extra-high-gain mode for very low-flux applications with 50 electrons of noise. The sensor is 320um thick and the QE with standard filter is shown at Other Info on the Overview page. AMI and psana return calibrated values in keV.

The 0.5M dimensions are approximately 30x9x10cm (38cm long including cooling hoses) and it weighs about 2kg; the 1M is about 30x13x10cm and 3.3kg. A mounting bracket is available. The camera supports custom filters.

Types	0.5mPixels, 1mPixels
# of Pixels	1024x512(x2)
Pixel Size	75um
Active area	77.3x38.6(x2)mm^2
Operating Temperature Range	Room temperature
Operating Pressure Range	Room
Operating Humidity Range	Don't drench
Max signal (8keV photons)	15000
Cooling	O(15C) water
Frame rate	Up to 2kHz

On the left, 1M camera from back. On the right, 0.5M camera with cover in place.

Front view of 1M camera.

Contact lcls-det-support@slac.stanford.edu for more information.