Neutron Intensified CCD cameras

PSL has supplied Neutron intensified cameras for the last 4 years to end users and OEMs. Fibre optic coupling of the intensifier enables optimum photonic transmission down to CCDs sensors, and best possible signal to noise ratio. Special gating options down to few ns and high repetition rates : ie 30 kHZ (MHz on option), allows fast digital acquisition of transcient and / or low light level events.

Applications:

- Neutron crystal alignment
- Back scattered neutron diffraction
- Single crystal neutron diffraction
- Neutron Laue imaging
- Neutron imaging
- Small neutron angle scattering
- Time of flight neutron diffraction
- Laue neutron diffraction

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Photonic Science

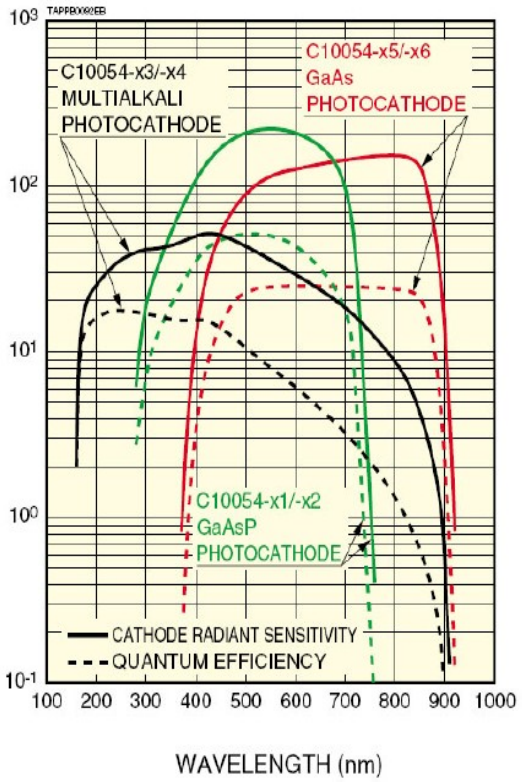
Information / products and services

Scientific detector systems

Intensified neutron cameras

Photonic Science Ltd selects premium grade intensifiers with :

- 4 or 6 microns pore size
- Fast P43 (1ms decay at 10%) and P46 (0.2ms at 10%) phopshor screens
- Single micro channel plate (MCP) resolution above > 60 lp / mm, high modulation contrast, and up to 8,000 luminous gain
- Dual MCP stack giving photon counting sensitivity with up to 300,000 luminous gain
- Input size varies from 18 mm up to 25 mm diagonal
- Quartz, glass and or fibre optic input windows, fibre optic output windows
- Multi-alkali photocathodes with Equivalent Background Illumination (EBI) noise down to 3 10^{-3} counts per pixel per second are used for UV and blue response cameras
- GaAsP and GaAs photocathodes are selected for visible and red response cameras respectively, EBI noise with 6 10^{-2} counts per pixel per second (cooling options for reduced noise operation)
- Standard gating option : 100 ns 30 kHz repetition rate
- Ultra fast gating down to 3 ns using special conductive underlaying coatings, MHz repetition rate is achieved using dedicated pulsers/gated power supply unit with adjustable gate time / delays down to nanosecond steps



Intensified CCD cameras

- 1872 (h) x 1252 (v) CCD array
- Input pixel size : 177x 177 microns
- LiF scintillator allowing optimized quantum efficiency with thermal neutrons
- 3 fps at full resolution @ 20 MHz
- Readout noise : 6-9 electrons @ 10 MHz
- Full well capacity : 13,000 electrons in binning 1x1
- Dark current : 0.01 electrons/pixel/second
- On chip binning up to 8x8
- 12-bit digitisation
- Extended 16-bit digitisation with up to >200,000 electrons equivalent full well capacity
- Firewire / Camera link / GigE interface
- Synchronisation / control : via TTL pulse

Panoramic Intensified CCD cameras

- 7488 (h) x 2505 (v) CCD array
- Input pixel size : 177 x 177 microns
- LiF scintillator allowing optimized quantum efficiency with thermal neutrons
- 0.7 fps at full resolution 8@10 MHz
- Readout noise : 6-9 electrons 8@10 MHz
- Full well capacity : 13,000 electrons
- Dark current: 0.05 electrons / pixel / frame at full resolution
- 12-bit digitisation
- Extended 16-bit digitisation with up to >200,000 electrons equivalent full well capacity
- Firewire / Camera link / GigE interface
- Synchronisation / control : via TTL pulse

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