DSS Detectors

Solid State Detectors:

Solid state detectors are opto-electronic devices used to convert incident photons to electronic signals. Available with wavelength ranges from 200 nm to beyond 20 µm, solid state detectors offer combined sensitivity, dependability, cost and efficiency not available in other devices.

DSS Detector Family:

The most sensitive solid state detectors for general spectroscopy are quantum type detectors. Quantum detectors interact with photons directly in their electronic structure. The two types of quantum detectors are photoemissive and photoconductive. Photoemissive detectors, called photodiodes, generate a voltage or current as a result of incident photons. They are easily interfaced to support electronics, as they minimally require only a receiver to measure the generated current or voltage. Photoconductive detectors, called photoconductors, change their resistance in response to photons. Photoconductors require special signal processing, which typically consist of a lockin amplifier and a chopper to extract the signal from their inherent noise.

A wide variety of detectors are available for spectroscopy applications. Proper selection is based on maximizing signal and reducing noise at a reasonable price. The three major issues to consider when selecting detectors, are:

- Wavelength range
- Signal to noise influences
- Detector performance (NEP, D*)

Jobin Yvon offer a complete family of solid state detectors for 0.2 to 15 µm range, especially selected for their low noise.

A mechanical interface (1427B) using a mirror for image magnification, simplifies the installation of the DSS detectors onto all JY monochromators.

Jobin Yvon also supplies controllers, lockin amplifiers and all other electronics used for signal acquisition.

Material	Range (µm)	NEP	Active area (mm)	Cooling
Si	0.2 – 1.1	-	10 ø	RT
Si	0.3 – 1.1	$2{\cdot}10^{-14}$	2.5 ø	RT-TE
Ge	0.8 – 1.8 0.8 – 1.75	$7{\cdot}10^{-13}$ $5{\cdot}10^{-14}$	2 ø 2 ø	RT TE
InGaAs	0.8 – 1.7 0.8 – 1.65 0.8 – 1.5	$6{\cdot}10^{-14}$ $1{\cdot}10^{-14}$ $1{\cdot}10^{-15}$	2 ø 2 ø 2 ø	RT TE LN2
InAs	1.0 – 3.6 1.0 – 3.55	$2{\cdot}10^{-10}$ $1{\cdot}10^{-11}$	2 ø 2 ø	RT TE
InSb	2.0 – 5.5	$1{\cdot}10^{-12}$	2 ø	LN2
Pbs	1.0 – 3.0 1.0 – 3.0	$2{\cdot}10^{-12}$ $1{\cdot}10^{-12}$	2x2 2x2	RT TE
PbSe	1.0 – 5.0 1.0 – 5.0	$5{\cdot}10^{-11}$ $2{\cdot}10^{-11}$	2x2 2x2	RT TE
MCT	2.0 – 10.0 1.0 – 12.0	$2{\cdot}10^{-9}$ $5{\cdot}10^{-12}$	2x2 2x2	TE LN2
Two color	Contact Jobin Yvon			

Jobin Yvon DSS Detectors Specifications

RT: Room temperature – TE: 1 stage Peltier – LN2: liquid nitrogen cooled

Acquisition Controllers for DSS Detectors

Jobin Yvon offers several single or dual acquisition controllers such as SpectrAcq II and DataScan II. These systems include one or two input channels configurable for:

- current or voltage input
- four selectable gains with 12 bit or 16 bit resolution
- up to four TTL input and output lines.

These controllers are driven by SpectraMax for Windows software or are easily programmable through LabView VI.

DSS detectors with 1427B opto-mechanical adapter for Jobin Yvon monochromators

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