



What is the advantage of a FAST SDD™?

In a word, speed. The FAST SDD™ provides high output count rates without compromising resolution. The FAST SDD™ is the best detector when output count rates are approaching or exceeding 100 kcps, i.e. when peaking times are 1 μs or below.

The plot below shows the energy resolution, at the 5.9 keV Mn Kα line, as a function of the maximum output count rate for Amptek's standard 25mm² SDD and for the 25mm² FAST SDD™. For an output count rate of tens of kcps, where the peaking time is several microseconds, the performance of the FAST SDD™ is the same as a standard SDD. But for output count rates approaching 100 kcps and higher, or alternately peaking times approaching 1 microsecond or below, the FAST SDD™ offers considerably better resolution for the same output count rate. The spectrum measured with a FAST SDD™ looks exactly like the spectrum from a standard SDD but measured at a higher count rate.

The FAST SDD™ uses the same radiation detector, and has the same collimator and packaging and window, so there are no differences in the response other than the count rate. The difference between the two is in the preamplifier circuit: the standard SDD has a JFET input with only the JFET inside the detector package, while the FAST SDD™ has an input MOSFET and uses an ASIC charge amplifier inside the detector package. The FAST SDD™ preamplifier has a slightly different interface, with a different output gain and output reset range.

