## Subject: Re: Normal Distributed Random Numbers Posted by thompson on Tue, 04 Sep 2001 21:34:40 GMT

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"Kay Bente" <KBente@lycos.de> writes:

- > Hi
- > I have to create arrays with normal distributed random numbers, but with
- > variable FWHM (Full width half max/standard deviation sigma?).
- > I want to add normal distributed noise to an image, so that the values
- > differ around a mean value.
- > In IDL there is a procedure to create such arrays RandomN, but you can't
- > change the FWHM and I can't find what FWHM the normal distribution there
- > has.
- > So I would be glad If somone can tell me how to create such arrays (maybe
- > outof uniform distributed arrays created with RandomU, I have no idea.
- > I'm using IDL 5.4

The RANDOMN() function creates a Gaussian distribution with an average of 0, and a standard deviation of 1. Mathematically, this is written as

$$EXP(-0.5*X^2)$$

If you want a different distribution, e.g. a different average or a different standard deviation, all you need to do is something

RanVals = AvgVal + Sigma\*RANDOMN(Seed, Num)

For example,

RanVals = 500 + 3\*RANDOMN(Seed, 10000)

would produce a bunch of random numbers with an average value of 500, and a standard deviation of 3. In other words, most of the numbers would be between 497 and 503.

(The FWHM of this distribution is 2\*Sigma\*SQRT(2\*ALOG(2)), or about 2.35\*Sigma, but I suspect you're really thinking about the standard deviation Sigma rather than the FWHM.)

William Thompson