Subject: Re: Roundoff error in SMOOTH
Posted by thompson on Wed, 26 May 1999 07:00:00 GMT
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landsman@stars.gsfc.nasa.gov (Wayne Landsman) writes:

> I was recently surprised to discover that applying the SMOOTH function to a
> non-negative array could yield an array with negative numbers. I give an
> example below. This problem is evidently due to some sort of roundoff error,
> since it does not occur when using double precision.   But it is not obvious to
> me how averaging 9 non-negative numbers (for a 3x3 box smooth) could yield a
> negative number, even allowing for roundoff error.

> Although not obvious from my simple example, this has nothing to do with edge
> effects -- I originally found the problem when 3x3 smoothing a 1024 x 1024
> array.

 (rest deleted)

My theory is that the SMOOTH function probably uses Fourier transforms to speed
up the convolution, and this is where the round-off error is sneaking in.

Bill Thompson