
Subject: Re: smooth function and rounding error
Posted by [simona bellavista](#) on Fri, 18 Dec 2009 15:02:32 GMT
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thanks Lorenzo, I missed that

> in the Help of the smooth function it is said that "If a Width
> value is even, then Width+1 will be used instead."

anyway it looks even worse, that is unexpected to me.

I tried those routines for width=[10,100,100]; I see the relative error gets bigger as the width gets smaller.

I include a subset of my data

```
0.11032583 0.094536981 0.075814606 0.056046214
0.037181503 0.021005635 0.0089338077 0.0018573446
6.1061458e-05
0.0032205319 0.010475696 0.020567541 0.032017375
0.043320873 0.053128306 0.060387275 0.064433200
0.065024946
0.062328237 0.056852040
```

I tried the following on the above data:

```
width=4
smoothed=SMOOTH(x,width)
smoothed_eq=smooth_equivalent(x,width)
diff=abs(smoothed-smoothed_eq)/double(smoothed)
```

and I get a diff ~0.5

I also found an old post

http://groups.google.it/group/comp.lang.idl-pwwave/browse_thread/thread/cfc1b4e88de957a1/e695c8d11af5446c?hl=it&lnk=gst&q=smooth#e695c8d11af5446c
where they talk about roundoff error in smooth, but it was 12 years ago!

recap of implementation:

```
function smooth_equivalent, A, width
n=n_elements(A)
y=DBLARR(n)
y=A
width=width+1
for i=(width)/2,n-(width)/2-1,1 do begin
  y[i]=total(A[i-width/2:i+width/2-1])/double(width) ; or double
  (width+1)
endfor
```

```
RETURN, y  
end
```

```
cheers,  
simona
```
