Subject: Re: Integration qpint
Posted by Craig Markwardt on Mon, 13 Aug 2012 09:00:07 GMT
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On Sunday, August 12, 2012 1:42:57 PM UTC-4, Gompie wrote:
> Hi
>
> Can anyone help. I am using qpint1d to integrate but i get
>
> "Program caused arithmetic error: Floating overflow:"
>
>
>
> The code is
>
> C1 = 1.1910427E-12
>
> c2=1.43883
>
> T=300
>
> c=c1*(c2^(-4))*T^4
>
> llimit=c2*2380/T
>
> ulimit=c2*2940/T
>
> print,"X=",llimit,ulimit
>
> lin= c*qpint1d('x^3/(EXP(X)-1)', llimit, +inf, /expr)
>
> rin=c*qpint1d('x^3/(EXP(X)-1)', ulimit, +inf, /expr)
>
> print,abs(lin-rin)
>
> end
>
>
>
> This outputs a number (i am not sure if it is correct) but it also says floating point error.

Check the status variable. It's not an error. You can verify this yourself by

IDL reports *any* overflow or underflow that occurs. That's not necessarily bad.

What do you think happens when you try to evaluate EXP(+inf)? Or EXP(+3000)? Your user function generates an overflow, that's what happens. IDL is warning you that it is treating EXP(+3000) equivalent to +infinity. That is what happens when IDL cannot evaluate the full range

of your user function with full precision. EXP(+3000) simply cannot be represented on a modern computer.

If you don't want overflow errors, then rewrite your expression to use EXP(-X) instead. Of course, then you will get underflow errors. Life sucks, doesn't it? :-)

If you really don't want overflow errors for this function, then you must avoid using +inf as your upper bound.

Craig Markwardt

Subject: Re: Integration qpint
Posted by Helder Marchetto on Mon, 13 Aug 2012 09:01:51 GMT
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On Sunday, August 12, 2012 7:42:57 PM UTC+2, Gompie wrote:
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>
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>
>
>
> This outputs a number (i am not sure if it is correct) but it also says floating point error.
>
> Thanks in advance
>
> Gompie

Hi Gompie,
I didn't go through the whole of your code, but you define T as an integer.
Try rerunning your code substituting this to the line where you define T:

T=300.0

Doing this, the value of c changes from 3.48598e-009 (T is integer) to 0.00225099 (T is floating point).

Maybe also change the definitions of llimit and ulimit to:
llimit=c2*2380.0/T
ulimit=c2*2940.0/T

This might help. But I have not tried the integration.

Cheers,
h

Subject: Re: Integration qpint
Posted by Gompie on Mon, 13 Aug 2012 12:30:20 GMT
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Hi Craig , Helder
Thanks a lot for helping me out with this incredibly useful function.
Gompie
