
Subject: Re: Fun with Int_tabulated.pro

Posted by [Paul Van Delst\[1\]](#) on Wed, 04 Nov 2009 00:18:15 GMT

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Hello,

I've been struggling with int_tabulated recently but for a different reason: it always performs spline interpolation. If you are integrating high-order Gaussian-like functions with an insufficient point density (e.g. some satellite sensor measured spectral response functions), it will always produce terrible results due to Gibbs-type phenomena. In general that's not unexpected, but a bugger of a problem to track down in automated day-to-day processing.

I'm writing my own integrator to allow for different interpolation schemes. It handles the problem you're having too by simply copying the input to temporaries, and then doing all the sorting/uniq'ing/etc.

Anyway.... apologies for hijacking the thread. I just wanted to mini-vent. :o)

cheers,

paulv

wlandsman wrote:

```
> I ran into a couple of gotchas with int_tabulated.pro this
> morning,    It performs numerical integration for the simple case:
>
> IDL> x = findgen(5)
> IDL> y = x^2
> IDL> print,int_tabulated(x,y)
> 21.3333
>
> But if one has flipped both vectors (say while converting wavelength
> to frequency), then -- even though a plot of the two vectors looks
> exactly the same -- int_tabulated gives a different answer.
>
> IDL> x = reverse(x) & y = reverse(y)
> IDL> print,int_tabulated(x,y)
> 42.3619
>
> A closer look at the int_tabulated documentation tells us that if X is
> not monotonic increasing, then one needs to set the /SORT keyword.
> So now we follow the documentation:
>
> IDL> print,int_tabulated(x,y,/sort)
> 21.3333
>
> and get the right answer again. But as the documentation also "sort"
```

> of warns
> you, setting the /SORT keyword reorders the input X and Y variables.
> This is
> probably not a problem unless one has modified the Y vector on the fly
> by
> some factor f
>
> f = findgen(5) + 0.5
> print,int_tabulated(x, y*f,/sort)
>
> Upon output, the X vector has been sorted, but the Y vector has not,
> since it
> was passed as part of a temporary variable y*f. So one has lost
> the one to
> one correspondence between X and Y, screwing up all subsequent
> processing.
>
> --Wayne
