Subject: differential equation solving when changing the coefficients with time
Posted by idlforum2424 on Mon, 05 Jan 2015 14:04:58 GMT
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Hi all,
I'd like to solve a differential equation in IDL using a Runge Kutta 4th order procedure. However the coefficients of my differential equation evolve with time. How can we pass the coefficients into the function that defines the differential equation or do you have any other way to manage that?
Typically my diff equation is something like Y'=aY+b with a and b two functions of time and I want to solve that for all timesteps I have.
Thanks.

Subject: Re: differential equation solving when changing the coefficients with time
Posted by Craig Markwardt on Mon, 05 Jan 2015 19:15:37 GMT
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On Monday, January 5, 2015 9:05:00 AM UTC-5, idlfor...@gmail.com wrote:
> Hi all,
> I'd like to solve a differential equation in IDL using a Runge Kutta 4th order procedure. However the coefficients of my differential equation evolve with time. How can we pass the coefficients into the function that defines the differential equation or do you have any other way to manage that?
> Typically my diff equation is something like Y'=aY+b with a and b two functions of time and I want to solve that for all timesteps I have.

IDL's RK4 passes "X" to your differential function. For you, X is time, so you can use this X variable to calculate Y' as you please.

EXAMPLE:
```
function differential, x, y
  a = (0.4*x + 10)
  b = (-7.2*x - 0.01*x^2)
  return, a*y + b
exit
```

Craig

Subject: Re: differential equation solving when changing the coefficients with time
Posted by idlforum2424 on Tue, 06 Jan 2015 16:12:44 GMT
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On Monday, January 5, 2015 8:15:39 PM UTC+1, Craig Markwardt wrote:
> On Monday, January 5, 2015 9:05:00 AM UTC-5, idlfor...@gmail.com wrote:
>> Hi all,
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thanks !
