Subject: IDL LSODE double precision
Posted by douglas Drumheller on Wed, 09 Aug 2017 19:37:51 GMT

I've used LSODE to solve a simple oscillator problems successfully before in double precision. But for the first time I'm running on a 64-bit machine with Windows 7. One of my old codes starting acting up. So I've boiled it down to a test problem of a simple 2nd order linear harmonic oscillator.

```
PRO test_LSODE

y=[1.,0]

result=fltarr(100,2)

result(0,*)=y

time=findgen(100)/10.

for i = 1,99 do result(i,*) = lsode(y,0,time(i),'diff')

plot,time,result(*,0)

end

Function diff, t, y
  return, [y(1),-!pi^2*y(0)]
end
```

The plot will be a cosine of 5 complete cycles with a period of 2.

Problems start when you try to use double precision. In fact just changing the first statement to

y=[1.0D0,0.0D0]

will return garbage. I've tried setting the other input variables to double also, but the key is that the input y to lsode can no longer be double precision.

One of things I have noticed is that in single precision LSODE does not alter the input value of y. In double precision it does. I'd be happy with an explanation of LSODE doesn't support double precision, except it did on my old 32-bit machine.

Does anyone know what is going on?