Subject: Re: Solving system of ODEs backwards in time?
Posted by Craig Markwardt on Fri, 04 Aug 2017 15:25:04 GMT
View Forum Message <> Reply to Message

On Sunday, July 30, 2017 at 2:37:48 PM UTC-4, Barry Lesht wrote:
> I have a system of ODEs describing how a system with N state variables (C) evolves in time. The basic equation set is dC/dt = (W + A dot C) / V in which C is the state variable vector at time i, V is a vector of constants, W is a known vector (a function of t), and A is a known matrix (similarly time variable). Given an initial condition C[0], I've been using LSODE to solve for the successive time steps, updating the initial condition and values of W and A along the way. This has worked well.
>
> Now I'd like to reverse the problem. That is, if I know the value of the state vector at time i, and the values of W and A at time i-1, I'd like to compute the value of the state vector at time i-1. In essence, I want to know what the initial condition had to be to arrive at the current state of the system given known V, W and A.
>
> Frankly, it's been many, many years since I took an ODE class and I wasn't very adept then. I'd greatly appreciate any advice on how to approach this problem.
>
> Thanks, Barry

Why can't you just use a negative time step in your call to LSODE?