Subject: Re: satellite orbit computation in IDL
Posted by Craig Markwardt on Thu, 04 Mar 2004 10:11:04 GMT
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cseynat@swiftdsl.com.au (Cedric Seynat) writes:

> Hello all,
>
> I am looking for IDL routines computing satellite positions as a
> function of time, given a set of initial orbital parameters.
>
> I have implemented basic orbit computation routines myself (based on
> Keplerian parameters), but I am looking for very accurate orbit
> propagation involving atmospheric drag, luni-solar perturbations,
> earth tides etc.

Cedric, why not ask for world peace at the same time? :-) You are asking for a pretty tall order. I'm actually interested in the same thing, but I work on it irregularly.

Judging from your request, you are interested in low earth orbiters (otherwise, why ask for atmospheric drag?).

I have a high precision predictor corrector integrator on my web page. The JPL ephemerides of the moon and Sun are available in IDL from my web page or the IDL astronomy web page. If you are interested in earth tracking station motions then I have several routines which compute very high precision positions and motions.

I have also privately developed routines for computing accelerations due to the non-spherical earth (i.e. standard expansions in spherical harmonics). Let me know if you are interested.

Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response

Subject: Re: satellite orbit computation in IDL
Posted by profxtjb on Thu, 04 Mar 2004 19:33:10 GMT
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Craig Markwardt <craigmnet@REMOVEcow.physics.wisc.edu> wrote in message news:
> I have a high precision predictor corrector integrator on my web page.

Craig, which bundle in your library contains the predictor-corrector? Quadpack?

-Thomas

Subject: Re: satellite orbit computation in IDL
Posted by CED on Mon, 12 Apr 2004 01:51:05 GMT
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Hello Craig,

Thank you for your reply. World peace would be good as well, yes!! :-)

Sorry for the delay in my reply. I do not get much time to work on this project, and have only been able to get back to it a few days ago.

I am interested in the routines you wrote. Can I find them on your web site? If so, what is its address? I am also interested in the routines for computation of earth station position.

I need very high accuracy because I am developing a simulation tool to generate GPS satellite data. If you are interested, I can send you more details about it.

Thanks for your help,

Cedric

Subject: Re: satellite orbit computation in IDL
Posted by Craig Markwardt on Mon, 19 Apr 2004 20:23:41 GMT
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"CED" <cseynat@swiftdsl.com.au> writes:

> Hello Craig,
>
> Thank you for your reply. World peace would be good as well, yes!! :-)
>
> Sorry for the delay in my reply. I do not get much time to work on this
> project, and have only been able to get back to it a few days ago.
>
> I am interested in the routines you wrote. Can I find them on your web
> site? If so, what is its address? I am also interested in the routines for
> computation of earth station position.

Cedric, I just put geopotential routines on line on my web page. They include the ability to compute the gravitational acceleration at any point outside of the earth. You need a "description" file for the geopotential model you want; some are provided, and it's easy to make new ones. You will need to download the actual model coefficients yourself. URLs are included.

As for your other desires: Lunisolar perturbations can be computed using the JPL ephemerides, routines for which can be found on the same page (JPLEPHREAD/INTERP). DDEABM is a high precision integrator.

I have some half-finished codes for atmospheric drag and earth tides, which I can send, and you can finish if you are motivated. :-) Solar radiation pressure and earth shadow models, you are on your own presently.

Yours,
Craig

P.S. http://cow.physics.wisc.edu/~craigm/idl/idl.html (under ephemerides)

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
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