Subject: Orbit calculations from TLE
Posted by natha on Thu, 26 May 2016 14:39:20 GMT
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Hi all,

Does anybody have a routine to compute a satellite orbit from the Two-line element set (TLE) ?

It would be amazing to have something like http://pyorbital.readthedocs.io/en/latest/ under IDL

Thank you in advance for your help,
nata

Subject: Re: Orbit calculations from TLE
Posted by Haje Korth on Fri, 27 May 2016 11:34:33 GMT
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This can be done with the SPICE Toolkit from the NAIF node of the NASA PDS. However, the procedure is not straight forward and instructions are beyond the effort I can provide here. The website is http://naif.jpl.nasa.gov/naif/.

On Thursday, May 26, 2016 at 10:39:22 AM UTC-4, nata wrote:
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>
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>
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> Thank you in advance for your help,
> nata

Subject: Re: Orbit calculations from TLE
Posted by lecacheux.alain on Fri, 27 May 2016 20:19:53 GMT
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Le jeudi 26 mai 2016 16:39:22 UTC+2, nata a écrit :
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I think you would have two possibilities:

1) do the entire calculation by using IDL. That should not be too difficult, because a TLE text file is simply the list of the Keplerian elements of the osculatrice orbit (i.e. the simple, unperturbated one which is the closest to the true one within some (validity) time interval). This orbit is an ellipse along which the satellite moves according to the 2nd Kepler law (the "loi des aires" in French). I guess that the procedure would involve three steps: i) reference the ellipse plane within your working frame, ii) put the satellite at the right position (depending on time) on the ellipse, iii) back transform the calculated position into your working reference frame.

2) directly use the Python pyportal library through the IDL to Python bridge (needs IDL v8.3+)

The second way is appealing. Could you test it ?
alx.

Subject: Re: Orbit calculations from TLE
Posted by Jim Pendleton on Fri, 27 May 2016 21:02:33 GMT
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On Thursday, May 26, 2016 at 8:39:22 AM UTC-6, nata wrote:
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There are some reference implementations in other languages at this site: https://celestrak.com/publications/AIAA/2006-6753/. No IDL, but it should not be too hard to port. I know it's been done before... I believe an efficient IDL port would be considerably fewer than 200 lines of IDL code, excluding comments.

Jim P.

Subject: Re: Orbit calculations from TLE
Posted by natha on Mon, 30 May 2016 12:47:32 GMT
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Hi guys,

And thank you for all your comments and answers. I've got IDL 8.5.1 on Friday and I think that I will try to link pyOrbital using the bridge. The API is quite well documented and the routines do exactly what I'm looking for.

I find it strange to not find a library or a piece of code to do the TLE calculations in IDL.
If you read this post and you have some code and/or you know where to find it, please share.

Thank you,
nata

Subject: Re: Orbit calculations from TLE
Posted by Brian Wolven on Wed, 08 Jun 2016 03:11:31 GMT
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On Thursday, May 26, 2016 at 10:39:22 AM UTC-4, nata wrote:
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I have an IDL version of the SGP4 code that was created by Jeff Beck at Lehigh University - he was also responsible for the MATLAB version that is more readily available, e.g., here: http://www.codeforge.com/article/215204.

The only problem is... I'm not sure where I got the code originally. You could try contacting the author - email is in the listing at the link above. Alternatively I could drop the folder in dropbox and provide a public link.

Subject: Re: Orbit calculations from TLE
Posted by natha on Wed, 08 Jun 2016 12:41:57 GMT
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Thanks Brian, better than nothing!

Subject: Re: Orbit calculations from TLE
Posted by Cindy[1] on Wed, 09 Nov 2016 16:08:39 GMT
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provide a public link.

Brian - that link no longer works - do you still have the IDL version of the SGP4 code?

Thanks