Subject: Re: satellite orbit computation in IDL
Posted by Roberto Monaco on Fri, 05 Mar 2004 23:42:42 GMT
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Cedric,

I took an existing C implementation of the SGPSDP orbital model by NORAD (I can't remember the link now) and wrapped it into a DLL, so that I could use from IDL (under Windows). I don't have this in an FTP server, but if you are interested I can send you the DLL, DLM, and a test IDL program (that shows how to use it).

To get meaningful information you need an actualized TLE file for the satellite or satellites you are interested in, which you can get from http://www.celestrak.com

There are two main functions from IDL:
- SGPSDP_INIT(tle_file, satellite_ID)
- SGPSDP_GETSAT (date_time, satellite_structure)

You call the SGPSDP_INIT to load the satellite orbital parameters from the TLE file (for a certain satellite), and to do some initializations. After this you call SGPSDP_GETSAT as many times as needed, to get the geographical position of the satellite (latitude, longitude, altitude) for a certain time (Julian date). This last function assumes a satellite structure which is shown in the IDL test program. SGPSDP_GETSAT also copies the previous time and position in the structure for convenience of use (I thought it was good to keep both, previous call and current call data together). You need to call SGPSDP_INIT again only if you change satellite, or TLE file, or both.

There is a third function that defines the position of an observer, needed to determine if the satellite is eclipsed or under sun light from the observer's position (if you care about this):
- SGPSDP_SETOBS(observer_data)

I don't have a documentation page (sorry), but I think all the parameters are shown in the test program.

I tested this against data provided in NORAD documentation, also using Dr. Kelso TrakStar program (http://www.celestrak.com), and finally with STK. It looks OK, but I can't honestly say that I have tested it thoroughly.

Regards,
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