NAIF/SPICE Newsletter

February 2019

Provided by NASA's Navigation and Ancillary Information Facility (NAIF)

Topics:

The Outlook for NAIF

NAIF's financial situation appears to be sound. We believe we have good relations with our various sponsors: NASA's Planetary Data System and twenty flight projects.

Updated SPICE-Enhanced Cosmographia Visualization Tool - Version 4.0

With only limited time available from our contractor it has taken some time to update the SPICE-Enhanced Cosmographia tool to work with modern versions of 3rd party libraries, and to add a few new features. We are pleased to announce this update has been completed and you may download the new version, available for OSX, Linux and Windows. Look here for details.

Updated WebGeocalc Tool - Versions 2.0.0 and 2.1.0

NAIF is re-announcing the availability of version (2.0.0) of WebGeocalc, a web browser-based interface to a SPICE geometry engine, made available in December 2018. The major change was the addition of a RESTful interface, but a few new calculations and other improvements were also added. Look here for details.

Since then we deployed a minor version update (2.1.0) that includes:

- Extended GUI and API Angular Separation calculation to allow additional direction types
- Added Local True Solar Time (LTST) to the output from some GUI and API calculations
- Added Phase Angle search and Range Rate search API calculations
- Streamlined the API interaction flow; improved API error responses and calculation results expiration

If you are contemplating using WebGeocalc, be sure to read the "About the Data" text available from a link at the top of the WebGeocalc home page. Pay particular attention to the red text in the section titled "Using Named Kernel Set Selection"; this addresses the time coverage of the SPICE data. Trying to make a computation outside of the available time coverage is probably the most common user problem.

Some partner space agencies such as the European Space Agency may offer their own instances of WebGeocalc. Be sure to read about their local setup of this service as it may differ somewhat from NAIF's offering.

Access to the NAIF Server

NASA is starting to disallow un-encrypted access to NASA-funded computers. Recently NAIF had to change access to our website from http to https protocol. A few months ago we announced that on March 22, 2019 we would no longer be able to offer anonymous FTP access to SPICE data. That restriction has been postponed for a while, but not indefinitely. Customers should be looking into using services such as wget and cURL. NAIF will provide an update on this situation once we have more information to share.

SPICE 2.0 (C++ Toolkit)

NAIF's major ongoing initiative is a re-implementation of the SPICE Toolkit using C++. This Toolkit will offer both thread safety and object-oriented features. We anticipate this "SPICE 2.0" implementation will take considerable time ("considerable" leaves lots of wiggle room!). In taking on this effort we'll **not** abandon our current suite of Toolkits (Fortran 77, C, IDL, MATLAB, and JNI).

SPICE 1.0 (existing Toolkits)

In parallel with our work on the new SPICE 2.0 C++ Toolkit, we are working on an assortment of updates and improvements to the existing (SPICE 1.0) Toolkits. We hope to have a release of Version N67 sometime during Summer 2019. We also hope the outside parties offering Python and Ruby interfaces to CSPICE will continue to do so, but this is outside of our control. See Links to Related Services for details.

SPICE Training

The next SPICE beginner's training class will be held in a hotel near Pasadena, CA on June 4 - 6. Check out the first announcement, and let your colleagues know about the class. The class is free of charge, but registration is required to reserve a seat. If attending a "live" class is not possible, consider using the self-training materials offered on the NAIF website. These are the same items used in the live classes.

Referencing NAIF and SPICE Data Providers

If you have found SPICE data and software useful in your research or tool development, consider referencing NAIF or including an acknowledgement in your publications. Please also consider acknowledging the people and teams (probably some of your colleagues) that produce the ancillary data that are captured in SPICE kernels. A "Credit" link on the NAIF web pages provides relevant information.

NASA Use of SPICE

As best we know all major NASA solar system exploration missions are using or will use SPICE. It is also used on some Heliophysics missions, and on at least two Earth Science missions. We have indications a few of the upcoming U.S. CubeSat missions will likely decide that using SPICE is appropriate and possible. But we have not had much success in generally contacting science-focused deep space missions about the availability of SPICE for CubeSats and SmallSats.

We're aware of some use of SPICE in support of human exploration engineering activities, particularly with regard to the Lunar Orbital Platform-Gateway endeavor. Perhaps SPICE will eventually find use supporting some of Gateway's solar system science experiments.

International Use of SPICE
As best we know ESA (Europe), JAXA (Japan) and ISRO (India) will continue using SPICE on solar system missions. Possibly ROSCOSMOS (Russia) will also continue using SPICE. The United Arab Emirates mission to Mars, EMM, with assistance from LASP at U. of Colorado, will be using SPICE, and the Korean Aerospace Research Institute's (KARI) upcoming Korean Pathfinder Lunar Orbiter mission (KPLO) has recently decided to use it. A chart summarizing many of the past, current and possible future missions that use SPICE is available here: https://naif.jpl.nasa.gov/naif/SPICE_Users.pdf

Export Status
SPICE data and software as provided by NAIF, and NAIF services, are **not** restricted under U.S. export rules (ITAR and EAR). Anyone outside of NAIF producing SPICE-based software must obtain their own export ruling.

NAIF's Development and Operations Philosophy
NAIF assumes if we pass out buggy or changed code, or incorrect or poorly documented data, users will look elsewhere for geometry solutions. (In some cases, there may not be a practical "elsewhere" to look, but that doesn't change our attitude.) NAIF pushes pretty hard on SPICE archive producers–both ourselves and other providers–to make high quality SPICE archives suitable for long-term use by the worldwide space science community.

Problem Solving
NAIF hopes most issues can be resolved by the user's carefully reading relevant code (API) headers, tutorials, and other documentation, such as the common_problems tutorial and the several Getting Help webpages. But when help is requested, we try to provide prompt, useful responses.

spice_announce: subscribing and unsubscribing
See https://naif.jpl.nasa.gov/mailman/listinfo/spice_announce for information about signing up to the NAIF announcement system. If you are already signed up but no longer wish to receive SPICE announcements, the same webpage allows you to easily unsubscribe. NAIF uses spice_announce rather sparingly to announce new Toolkits, major new generic kernels, bugs (we try to have none…), SPICE training opportunities, and a few other sorts of topics that could be of broad interest. We do not share your names or email addresses with anyone, nor do we ourselves use them beyond this spice_announce system. Some additional announcements are posted to NAIF's "Announcements" webpage: https://naif.jpl.nasa.gov/naif/announcements.html

Comments on NAIF's Website?
We are interested in hearing any comments you may have about the pages (documentation and appearance) and functions offered by the NAIF website: https://naif.jpl.nasa.gov. We know that everyone has their own idea about website design, so it's rather dangerous to solicit comments. But if there any major deficiencies in the NAIF website, we should address them. We're particularly interested in your opinion on how easy or difficult it is to find , obtain and understand the SPICE data (the "kernels") you seek.

Other Feedback
We appreciate hearing your suggestions for improving SPICE or NAIF operations; this includes any criticism you'd care to provide. You can write to the NAIF manager or anyone else on the NAIF Team, or to any of the Planetary Data System (PDS) officials who oversee our efforts.

Mr. Charles Acton, NAIF Manager charles.h.acton (at) jpl.nasa.gov
Ms. Maria Banks, PDS Project Manager maria.e.banks (at) nasa.gov
Dr. Edwin Grayzeck, PDS Project Scientist edwin.j.grayzeck (at) nasa.gov
Ms. Carole Boyles, Manager for JPL-based PDS nodes carole.a.boyles (at) jpl.nasa.gov
Mr. William Knopf, NASA PDS Program Executive william.knopf-1 (at) nasa.gov

If you've found SPICE useful in your space science mission or independent work, consider letting your colleagues know about it; perhaps even offer them a hand in getting started using SPICE.

NAIF resides within the Mission Design and Navigation Section at JPL.

NAIF is primarily sponsored by the Planetary Data System program, managed by NASA's Planetary Science Division. The PDS Project Office is located at NASA's Goddard Space Flight Center.

The offerings described in this publication are developed at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.