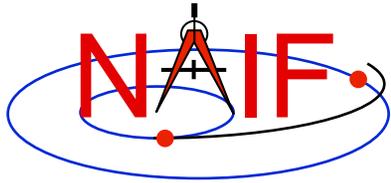


Navigation and Ancillary Information Facility

SPICE Development Plans and Possibilities

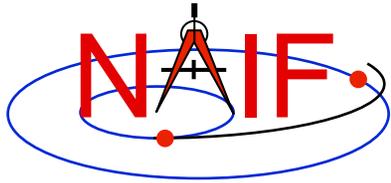
January 2012



Outline

Navigation and Ancillary Information Facility

- **Work in progress**
- **Future possibilities**
- **Your suggestions?**

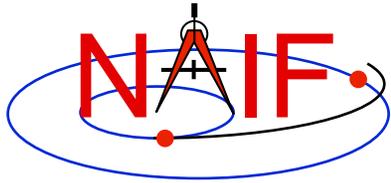


Work In Progress - 1

Navigation and Ancillary Information Facility

- **Extension of the shape model subsystem**
 - The task is to add two new shape model capabilities...
 - » tessellated plate model, for small, irregularly shaped bodies
 - » digital elevation model
 - to the existing tri-axial shape model found in PCK

 - **Status**
 - » An alpha-test prototype of the plate model has been given to several projects and persons
 - » Date for release of a “final” version is not yet determined



Work in Progress - 2

Navigation and Ancillary Information Facility

Java/Spice Interface test

Kernels Computations Drawings Log

Illumination Angles

"GEOCALC"

Target: Mars

Observer: MEX

Surface point longitude: 114.786907

Surface point latitude: -14.773171

Observation epoch: 2004 Jan 4 08:52:00.707724

Aberration Correction: NONE, LT, LT+S

Coordinate System: Planetocentric, Planetodetic

Compute

Illumination angles at surface point, as seen from observer

Target	Mars
Observer	MEX
Aberration correction	NONE
Time	2004 Jan 4 08:52:00.707724
Surface planetocentric longitude (deg)	114.786907
Surface planetocentric latitude (deg)	-14.773171
Phase angle (deg)	37.317459
Solar incidence angle (deg)	37.317454
Emission angle (deg)	0.000007

Provide a GUI interface to many SPICE computations. Availability date is unknown.

In this example, compute the illumination angles on Mars at LON 114.7 and LAT -14.7 as seen from Mars Express on 2004 JAN 4 08:52:00. The user can pick either a planetocentric or planetodetic reference frame.

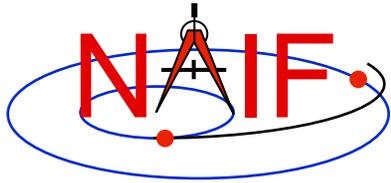


Work in Progress - 3

Navigation and Ancillary Information Facility

- **Java Native Interface (JNI Spice)**
 - An alpha-test release was made in February, 2010
 - Official addition to the Toolkit perhaps in the Fall of 2012

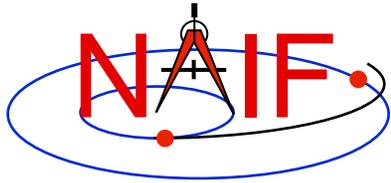
- **Python**
 - Considerable prototyping has been done
 - Whether or not this effort will proceed, and when, is uncertain



Some Other Possibilities - 1

Navigation and Ancillary Information Facility

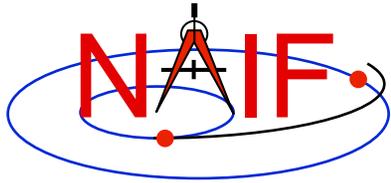
- **Provide a GUI tool that will contrast a set of SPK files, thus aiding you in selecting the one(s) of interest**
- **Provide a GUI tool for easier creation of a SPICE frame, and subsequent visualization thereof**
- **Provide a “predict spk” tool that makes it easy to construct an SPK file from simple rules**
- **Add more high-level computations, such as instrument footprint coverage**
- **Provide a star catalog integrated with SPICE capabilities**



Some Other Possibilities - 2

Navigation and Ancillary Information Facility

- **Additional target models: rings, gravity, atmosphere, magnetosphere, ...**
- **Develop a more flexible and extensible instrument modeling mechanism**



What do **You** Suggest?

Navigation and Ancillary Information Facility

- **NAIF solicits suggestions from the user community.**
 - **Caution: we're a small team and have a large backlog, so we can't promise any particular action.**
- **We're interested in programmatic ideas as well as technical ones.**
 - **Should NAIF promote use of SPICE beyond NASA's planetary science program?**
 - **What amount of cooperation and interoperability with foreign partners is appropriate and achievable?**