

EXAMINING MARS WITH SPICE. Charles H. Acton, Nathaniel Bachman, Jeff Bytof, Boris Semenov, William Taber, Scott Turner, and Edward Wright, Jet Propulsion Laboratory, California Institute of Technology, Mail Stop 301-125L, 4800 Oak Grove Drive, Pasadena CA 91109, USA (charles.acton@jpl.nasa.gov).

The International Mars Conference highlights the wealth of scientific data now and soon to be acquired from an international armada of Mars-bound robotic spacecraft. Underlying the planning and interpretation of these scientific observations around and upon Mars are ancillary data and associated software needed to deal with trajectories or locations, instrument pointing, timing and Mars cartographic models. The NASA planetary community has adopted the SPICE system of ancillary data standards and allied tools to fill the need for consistent, reliable access to these basic data and a near limitless range of derived parameters.

After substantial rapid growth in its formative years, the SPICE system continues to evolve today to meet new needs and improve ease of use. Adaptations to handle landers and rovers were prototyped on the Mars pathfinder mission and will next be used on Mars '01-'05. Incorporation of new methods to readily handle non-inertial reference frames has vastly extended the capability and simplified many computations. A translation of the SPICE Toolkit software suite to the C language has just been announced.

To further support cartographic calculations associated with Mars exploration the SPICE developers at JPL have recently been asked by NASA to work with cartographers to develop standards and allied software for storing and accessing control net and shape model data sets; these will be highly integrated with existing SPICE components.

NASA specifically supports the widest possible utilization of SPICE capabilities throughout the international space science community. With NASA backing the Russian Space Agency and Russian Academy of Science adopted the SPICE standards for the Mars 96 mission. The SPICE ephemeris component will shortly become the international standard for agencies using the Deep Space Network. U.S. and European scientists hope that ESA will employ SPICE standards on the Mars Express mission. SPICE is an open set of standards, and all related specifications and software are freely distributed around the world.

This poster describes the current state of SPICE system development, with special emphasis on current and planned support for Mars exploration missions.

Development of the SPICE system was carried out by the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.