The TSPT software can temporally process a variety of MODIS multispectral data products on a per-pixel basis. Generally, the TSPT runs on one user-specified kind of MODIS data product to generate a given time series data product. The TSPT can process output from the MODIS Re-projection Tool (MRT) as input, or can directly convert MODIS Hierarchical Data Format (HDF) sinusoidal gridded data to BSQ input files.

Unlike other known vegetation phenological parameter estimation software, the PPET produces not only common phenological parameters, but also real-time and custom parameters without *a priori* assumptions about the shape of the phenological cycle. Common phenological parameters, like those produced in PPET, are associated with the annual vegetation growth cycle. They quantitatively describe vegetative states related to annual cyclical growing seasons, such as green-up, maturity, senescence, and dormancy by analyzing the temporal shape of given vegetation index time series. The real-time phenological and custom parameters are formed from a cumulative sum (integral) produced at a fixed temporal interval. In addition, cumulative vegetation index and time-specific/pest-specific phenological parameters can be designed to optimize the detection of vegetation damage from specific pests and diseases. These problem-specific, phenological parameters have the potential to be integrated into near real-time, predictive surveillance systems (i.e. early warning systems) and, with improved vegetative state information, could assist decision makers in making intelligent vegetation and associated land resource management choices.

This work was done by Rodney D. McKellip of Stennis Space Center; Kenton W. Ross, Joseph P. Spruce, James C. Smoot, and Robert E. Ryan of Science Systems and Applications, Inc.; Gerald E. Gasser of Lockheed Martin; and Donald L. Prados and Ronald D. Vaughan of Computer Sciences Corp.

Inquiries concerning rights for the commercial use of this invention should be addressed to the Intellectual Property Manager at Stennis Space Center (228) 688-1929. SSC-00321

XMbodyinfo

NASA's Jet Propulsion Laboratory, Pasadena, California

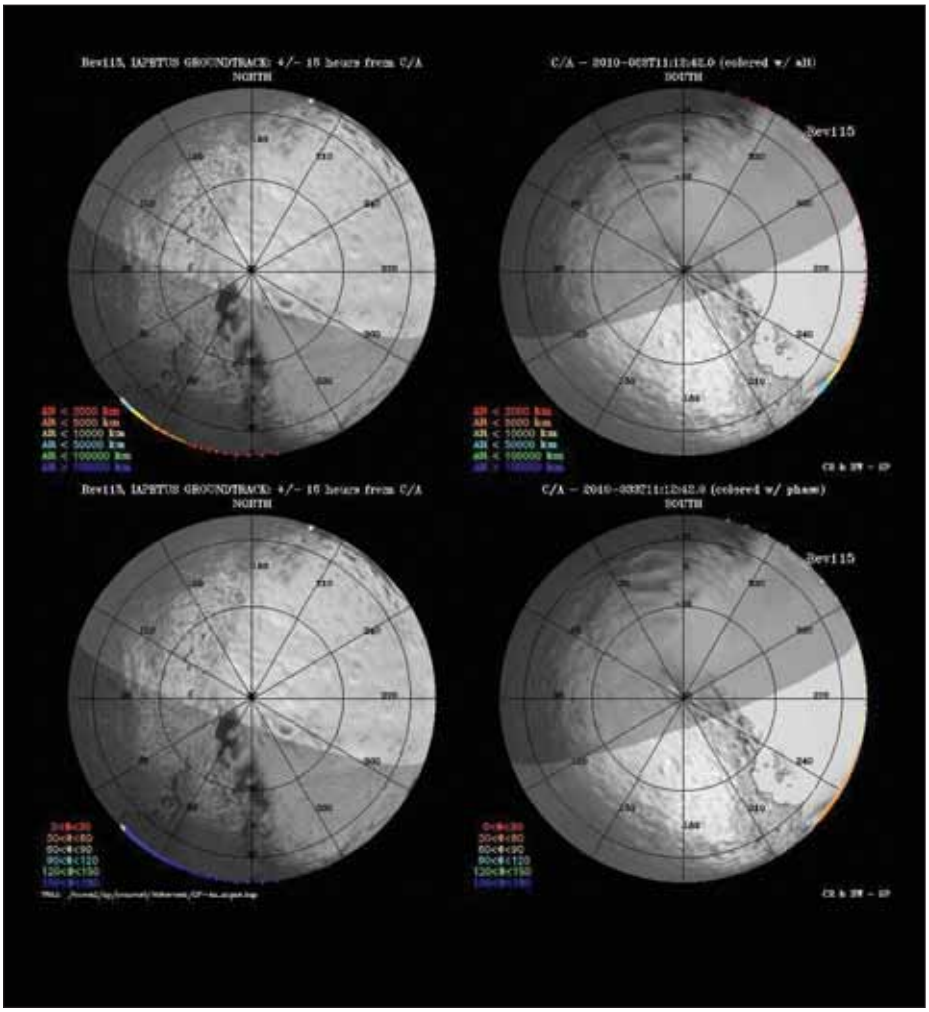
XMbodyinfo was designed to evaluate potential reference trajectories, providing a proficient way to assess the quality of all satellite body flybys for a Cassini type mission tour. It is autonomous and will generate a variety of ORS (optical remote sensing) and FPW (fields, particles, and waves) plots that aid in the evaluation, qualification, selection, and improvement of a potential tour (see figure).

XMbodyinfo attempts to streamline the tour design process. More specifically, it attempts to streamline the approval process, interaction, and subsequent iteration that must occur between the tour designers and the science teams during the design and development of a tour.

It can quickly produce various geometry plots and ground tracks for Saturnian satellite flybys when given an input trajectory, a C/A (closest approach) time in SCET (Spacecraft Event Time), and a flyby label. All instrument teams and science disciplines used this tool extensively to aid in the selection of Cassini's extended mission tour.

This work was done by Chris Roumeliotis and Bradford D. Wallis of Caltech for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-46482.



Individual Flyby Groundtrack Plot is color coded with altitude and phase angle (polar projection). This is one of a number of plots provided by XMbodyinfo.