

double-sideband nature of most measurements. Estimates of the random component of uncertainty (noise) on each limb radiance are also determined. Spacecraft inertial pointing and star tracker data are combined with spacecraft and GHz antenna structural/thermal data and scan mechanism encoder data to estimate the boresight angles for each radiometer. The software collects and generates ancillary data (e.g., tangent point location, local solar time, local solar zenith angle, flags for bright objects in the field of view) that are needed in Level 2 processing. A log file is produced that summarizes instrument performance and outputs.

This work was done by Vincent S. Perun, Robert F. Jarnot, Paul A. Wagner, Richard E. Cofield IV, and Honghanh T. Nguyen of Caltech and Christina Vuu of Raytheon for NASA's Jet Propulsion Laboratory. For more information, contact iaoffice@jpl.nasa.gov.

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Cassini Tour Atlas Automated Generation

During the Cassini spacecraft's cruise phase and nominal mission, the Cassini Science Planning Team developed and maintained an online database of geometric and timing information called the Cassini Tour Atlas. The Tour Atlas consisted of several hundreds of megabytes of EVENTS mission planning software outputs, tables, plots, and images used by mission scientists for observation planning. Each time the nominal

mission trajectory was altered or tweaked, a new Tour Atlas had to be regenerated manually.

In the early phases of Cassini's Equinox Mission planning, an *a priori* estimate suggested that mission tour designers would develop approximately 30 candidate tours within a short period of time. So that Cassini scientists could properly analyze the science opportunities in each candidate tour quickly and thoroughly so that the optimal series of orbits for science return could be selected, a separate Tour Atlas was required for each trajectory.

The task of manually generating the number of trajectory analyses in the allotted time would have been impossible, so the entire task was automated using code written in five different programming languages. This software automates the generation of the Cassini Tour Atlas database. It performs with one UNIX command what previously took a day or two of human labor.

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Software Development Standard Processes (SDSP)

A JPL-created set of standard processes is to be used throughout the lifecycle of software development. These SDSPs cover a range of activities, from management and engineering activities,

to assurance and support activities. These processes must be applied to software tasks per a prescribed set of procedures. JPL's Software Quality Improvement Project is currently working at the behest of the JPL Software Process Owner to ensure that all applicable software tasks follow these procedures.

The SDSPs are captured as a set of 22 standards in JPL's software process domain. They were developed in-house at JPL by a number of Subject Matter Experts (SMEs) residing primarily within the Engineering and Science Directorate, but also from the Business Operations Directorate and Safety and Mission Success Directorate. These practices include not only currently performed best practices, but also JPL-desired future practices in key thrust areas like software architecting and software reuse analysis. Additionally, these SDSPs conform to many standards and requirements to which JPL projects are beholden.

This work was done by Milton L. Lavin, James J. Wang, Ronald Morillo, John T. Mayer, Barzia Jamshidian Tehrani, Kenneth J. Shimizu, Belinda M. Wilkinson, Jairus M. Hihn, Rosana B. Borgen, Kenneth N. Meyer, Kathleen A. Crean, George C. Rinker, Thomas P. Smith, Karen T. Lum, Robert A. Hanna, Daniel E. Erickson, Edward B. Gamble Jr., Scott C. Morgan, Michael G. Kelsay, Brian J. Newport, Scott A. Lewicki, Jeane G. Stipanuk, Tonja M. Cooper, and Leila Meshkat of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

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