

adjusting mission scenarios using power profiles generated by the model; system engineers for performing system-level trade studies using the results of the model during the early design phases of a spacecraft; and operations

personnel for high-fidelity modeling of the essential power aspect of the planning picture.

*This work was done by Eric G. Wood, George W. Chang, and Fannie C. Chen of Caltech for NASA's Jet Propulsion Laboratory.*

*For more information, contact [iaoffice@jpl.nasa.gov](mailto: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](mailto:danielb@caltech.edu). Refer to NPO-48152.*

---

## Jupiter Environment Tool

*NASA's Jet Propulsion Laboratory, Pasadena, California*

The Jupiter Environment Tool (JET) is a custom UI plug-in for STK that provides an interface to Jupiter environment models for visualization and analysis. Users can visualize the different magnetic field models of Jupiter through various rendering methods, which are fully integrated within STK's 3D Window. This allows users to take snapshots and make animations of their

scenarios with magnetic field visualizations. Analytical data can be accessed in the form of custom vectors. Given these custom vectors, users have access to magnetic field data in custom reports, graphs, access constraints, coverage analysis, and anywhere else vectors are used within STK.

*This work was done by Erick J. Sturm, Kenneth M. Donahue, James P. Biehl, and*

*Michael Kokorowski of Caltech; Cedrick Ngalande of Microcosm, Inc.; and Jordan Boedeker of Iowa State University for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).*

*This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at [danielb@caltech.edu](mailto:danielb@caltech.edu). Refer to NPO-47998.*

---

## Jet and Tropopause Products for Analysis and Characterization (JETPAC)

*NASA's Jet Propulsion Laboratory, Pasadena, California*

This suite of IDL programs provides identification and comprehensive characterization of the dynamical features of the jet streams in the upper troposphere, the lower stratospheric polar night jet, and the tropopause. The output of this software not only provides comprehensive information on the jets and tropopause, but also gives this information in a form that facilitates studies of observations in relation to the jets and tropopauses.

The programs use data from gridded meteorological analyses (including, currently, GEOS-5/MERRA and NCEP/GFS, but are designed to easily adapt to others) to identify the locations and char-

acteristics (wind speed, temperature, wind components, potential vorticity, equivalent latitude, potential temperature, relative vorticity, and other fields) at the jet maximum and the edges of the jet regions. It also compiles detailed tropopause information based on several commonly used definitions of the tropopause, including cataloging times/locations with multiple tropopauses. These products are calculated for the complete gridded meteorological datasets, and the differences between jet locations/characteristics and measurement locations/characteristics cataloged for several satellite (currently, Aura MLS, ACE, and HIRDLS) and aircraft (currently START-

08, Winter Storms, SPURT) datasets.

These products are currently being used in studies compiling jet and tropopause climatologies, and to characterize trace gas observations in relation to the jets and tropopauses. The output products will be made available to other collaborators, and eventually will be publicly available.

*This work was done by Gloria L. Manney and William H. Daffer of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).*

*This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at [danielb@caltech.edu](mailto:danielb@caltech.edu). Refer to NPO-47709.*

---

## WGM Temperature Tracker

*NASA's Jet Propulsion Laboratory, Pasadena, California*

This software implements digital control of a WGM (whispering-gallery-mode) resonator temperature based on the dual-mode approach. It comprises one acquisition (dual-channel) and three control modules. The interaction of the proportional-integral

loops is designed in the original way, preventing the loops from fighting. The data processing is organized in parallel with the acquisition, which allows the computational overhead time to be suppressed or often completely avoided.

WGM resonators potentially provide excellent optical references for metrology, clocks, spectroscopy, and other applications. However, extremely accurate (below micro-Kelvin) temperature stabilization is required. This software allows one specifically advantageous