

ple size over which the cross-correlation is measured to increase the accuracy of the measurement. This increases the robustness of the measurement to variable magnitudes of inter-frame jitter.

*This work was done by Mordecai J. Waegell and David M. Palacios 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-47215.*

## MSLICE Sequencing

MSLICE Sequencing is a graphical tool for writing sequences and integrating them into RML files, as well as for producing SCMF files for uplink. When operated in a testbed environment, it also supports uplinking these SCMF files to the testbed via Chill.

This software features a freeform textual sequence editor featuring syntax coloring, automatic content assistance (including command and argument completion proposals), complete with types, value ranges, unites, and descriptions from the command dictionary that appear as they are typed. The sequence editor also has a "field mode" that allows tabbing between arguments and displays type/range/units/description for each argument as it is edited. Color-coded error and warning annotations on problematic tokens are included, as well as indications of problems that are not visible in the current scroll range. "Quick Fix" suggestions are made for resolving problems, and all the features afforded by modern source editors are also included such as copy/cut/paste, undo/redo, and a sophisticated find-and-replace system optionally using regular expressions.

The software offers a full XML editor for RML files, which features syntax coloring, content assistance and problem annotations as above. There is a form-based, "detail view" that allows structured editing of command arguments and sequence parameters when preferred. The "project view" shows the user's "workspace" as a tree of "resources" (projects, folders, and files) that can subsequently be opened in editors by double-clicking.

Files can be added, deleted, dragged-dropped/copied-pasted between folders or projects, and these operations are undoable and redoable.

A "problems view" contains a tabular list of all problems in the current workspace. Double-clicking on any row in the table opens an editor for the appropriate sequence, scrolling to the specific line with the problem, and highlighting the problematic characters. From there, one can invoke "quick fix" as described above to resolve the issue. Once resolved, saving the file causes the problem to be removed from the problem view.

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This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47292.

## EOS MLS Level 2 Data Processing Software Version 3

This software accepts the EOS MLS calibrated measurements of microwave radiances products and operational meteorological data, and produces a set of estimates of atmospheric temperature and composition. This version has been designed to be as flexible as possible. The software is controlled by a Level 2 Configuration File that controls all aspects of the software: defining the contents of state and measurement vectors, defining the configurations of the various forward models available, reading appropriate *a priori* spectroscopic and calibration data, performing retrievals, post-processing results, computing diagnostics, and outputting results in appropriate files.

In production mode, the software operates in a parallel form, with one instance of the program acting as a master, coordinating the work of multiple slave instances on a cluster of computers, each computing the results for individual chunks of data. In addition, to do conventional retrieval calculations and producing geophysical products, the Level 2 Configuration File can instruct

the software to produce files of simulated radiances based on a state vector formed from a set of geophysical product files taken as input. Combining both the retrieval and simulation tasks in a single piece of software makes it far easier to ensure that identical forward model algorithms and parameters are used in both tasks. This also dramatically reduces the complexity of the code maintenance effort.

*This work was done by Nathaniel J. Livesey, W. Van Snyder, William G. Read, Michael J. Schwartz, Alyn Lambert, Michelle L. Santee, Honghanh T. Nguyen, Lucien Froidevaux, Shuhui Wang, Gloria L. Manney, Dong L. Wu, and Paul A. Wagner of Caltech; Christina Vuu of Raytheon; and Hugh C. Pumphrey of the University of Edinburgh 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-47221.*

## DspaceOgre 3D Graphics Visualization Tool

This general-purpose 3D graphics visualization C++ tool is designed for visualization of simulation and analysis data for articulated mechanisms. Examples of such systems are vehicles, robotic arms, biomechanics models, and biomolecular structures. DspaceOgre builds upon the open-source Ogre3D graphics visualization library. It provides additional classes to support the management of complex scenes involving multiple viewpoints and different scene groups, and can be used as a remote graphics server.

This software provides improved support for adding programs at the graphics processing unit (GPU) level for improved performance. It also improves upon the messaging interface it exposes for use as a visualization server.

*This work was done by Abhinandan Jain, Steven Myint, and Marc I. Pomerantz 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-47380.*