

The tool has been used to plan missions for radar, lidar, and in-situ atmospheric measuring instruments for a variety of aircraft. It has also been used for global and regional scale campaigns and automatically includes landings when refueling is required.

The software has been compared to the flight times of known commercial

aircraft route travel times, as well as a UAVSAR (Uninhabited Aerial Vehicle Synthetic Aperture Radar) campaign, and was within 15% of the actual flight time. Most of the discrepancy is due to non-optimal flight paths taken by actual aircraft to avoid restricted airspace and used to follow landing and take-off corridors.

*This work was done by Bogdan Oaida, Mohammed O. Khan, and Michael B. Mercury 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-48127.*

## Earth-Science Data Co-Locating Tool

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

This software is used to locate Earth-science satellite data and climate-model analysis outputs in space and time. This enables the direct comparison of any set of data with different spatial and temporal resolutions. It is written in three separate modules that are clearly separated for their functionality and interface with other modules. This enables a fast develop-

ment of supporting any new data set. In this updated version of the tool, several new front ends are developed for new products.

This software finds co-locatable data pairs for given sets of data products and creates new data products that share the same spatial and temporal coordinates. This facilitates the direct comparison between the two heterogeneous datasets

and the comprehensive and synergistic use of the datasets.

*This work was done by Seungwon Lee, Lei Pan, and Gary L. Block 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-48506.*

## Ascent/Descent Software

*Lyndon B. Johnson Space Center, Houston, Texas*

The Ascent/Descent Software Suite has been used to support a variety of NASA Shuttle Program mission planning and analysis activities, such as range safety, on the Integrated Planning System (IPS) platform. The Ascent/Descent Software Suite, containing Ascent Flight Design (ASC)/Descent Flight Design (DESC)

Configuration items (Cis), lifecycle documents, and data files used for shuttle ascent and entry modeling analysis and mission design, resides on IPS/Linux workstations. A list of tools in Navigation (NAV)/Prop Software Suite represents tool versions established during or after the IPS Equipment Rehost-3 project.

*This work was done by Charles Brown, Robert Andrew, Scott Roe, Ronald Frye, Michael Harvey, Tuan Vu, Krishnaiyer Balachandran, and Ben Bly of the United Space Alliance for Johnson Space Center. For further information, contact the JSC Innovation Partnerships Office at (281) 483-3809. MSC-24960-1*