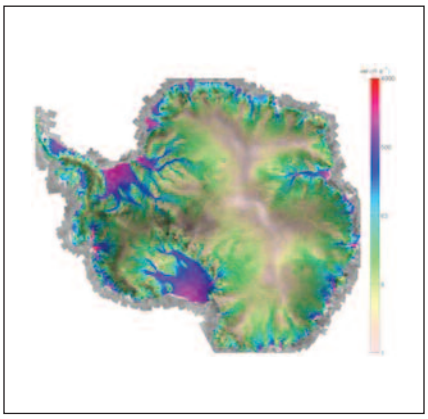
uted. It can run on the largest clusters, and is fully scalable. This allows ISSM to tackle models the size of continents.

ISSM is embedded into MATLAB and Python, both open scientific platforms. This improves its outreach within the science community. It is entirely written in C/C++, which gives it flexibility in its design, and the power/speed that C/C++ allows. ISSM is svn (subversion) hosted, on a JPL repository, to facilitate its development and maintenance.

ISSM can also model propagation of rifts using contact mechanics and mesh splitting, and can interface to the Dakota software. To carry out sensitivity analysis,



Modeled Antarctic Surface Velocity using ISSM.

mesh partitioning algorithms are available, based on the Scotch, Chaco, and Metis partitioners that ensure equal area mesh partitions can be done, which are then usable for sampling and local reliability methods.

This work was done by Eric Larour and John E. Schiermeier of Caltech, and Helene Seroussi and Mathieu Morlinghem of Ecole Centrale Paris for NASA's Jet Propulsion Laboratory. For more information, see http://issm.jpl.nasa.gov/.

This software is available for commercial licensing. Please contact Dan Broderick at Daniel.F.Broderick@jpl.nasa.gov. Refer to NPO-48164.

Automated Loads Analysis System (ATLAS)

Lyndon B. Johnson Space Center, Houston, Texas

ATLAS is a generalized solution that can be used for launch vehicles. ATLAS is used to produce modal transient analysis and quasi-static analysis results (i.e., accelerations, displacements, and forces) for the payload math models on a specific Shuttle Transport System (STS) flight using the shuttle math model and associated forcing functions. This innovation solves the problem of coupling of payload math models into a shuttle math model. It performs a transient loads analysis simulating liftoff, landing, and all flight events between liftoff and landing.

ATLAS utilizes efficient and numerically stable algorithms available in MSC/NASTRAN.

This work was done by Stephen Gardner, Scot Frere, and Patrick O'Reilly of The Boeing Company for Johnson Space Center. For further information, contact the JSC Innovation Partnerships Office at (281) 483-3809. MSC-24987-1

Integrated Main Propulsion System Performance Reconstruction Process/Models

Lyndon B. Johnson Space Center, Houston, Texas

The Integrated Main Propulsion System (MPS) Performance Reconstruction process provides the MPS post-flight data files needed for post-flight reporting to the project integration management and key customers to verify flight performance. This process/model was used as the baseline for the currently ongoing Space Launch System (SLS) work.

The process utilizes several methodologies, including multiple software programs, to model integrated propulsion system performance through space shuttle ascent. It is used to evaluate integrated propulsion systems, including propellant tanks, feed systems, rocket engine, and pressurization systems performance throughout ascent based on flight pressure and temperature data. The latest revision incorporates new methods based on main engine power balance model updates to model higher mixture ratio operation at lower engine power levels.

This work was done by Eduardo Lopez, Katie Elliott, Steven Snell, and Michael Evans of The Boeing Company for Johnson Space Center. For further information, contact the JSC Innovation Partnerships Office at (281) 483-3809. MSC-25066-1

Phoenix Telemetry Processor

NASA's Jet Propulsion Laboratory, Pasadena, California

Phxtelemproc is a C/C++ based telemetry processing program that processes SFDU telemetry packets from the Telemetry Data System (TDS). It generates Experiment Data Records (EDRs) for several instruments including surface stereo imager (SSI); robotic arm camera (RAC); robotic arm (RA); microscopy, electrochemistry, and conductivity analyzer (MECA); and the optical microscope (OM). It processes both uncompressed and compressed telemetry, and incorporates unique subroutines for the following compression algorithms: JPEG Arithmetic, JPEG Huffman, Rice, LUT3, RA, and SX4.

This program was in the critical path for the daily command cycle of the