

the outputs of the other sensors to correct for contributions of humidity to those readings. Hence, in principle, what remains after corrections are the contributions of the analytes only.

The outputs of the non-humidity sensors are then deconvolved to obtain the concentrations of the analytes. In addition,

the humidity reading is retained as an analyte reading in its own right. This subtraction of the humidity background increases the ability of the software to identify such events as spills in which contaminants may be present in small concentrations and accompanied by large changes in humidity.

This program was written by Hanying Zhou of Caltech for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-30859.

Space Propulsion Design and Analysis

Marshall Space Flight Center, Alabama

This software provides an improved methodology for predicting launcher base pressure and heat loads for RSRM (Reusable Solid Rocket Motor) launchers by accounting for complex anisotropic stress/strains and variable turbulent Prandtl and Schmidt numbers. A "building block" approach to turbulence model development, and validation has been applied for improved missile/launcher base region analysis.

Modifications to existing $k - \epsilon$ turbulence models and application of scalar

variance models are incorporated into a RANS-based method for aeropropulsive flow modeling, directly related to base flow methodology. (RANS stands for Reynolds-averaged Navier-Stokes.) The models are applied in a RANS solver framework and can improve analysis of other complex flow fields.

The enhanced models provide a more accurate predictive capability for improving the design and analysis of RSRM launcher configuration. The $k - \epsilon$ model enhancements have been

shown to improve the capability for predicting turbulence effects in base blow environments. The scalar variance models have been assessed over a wide range of flow configurations to improve prediction of turbulent scalar mixing.

This program was written by Neeraj Sinha, Kevin Brinckman, Haritha Ayyalasomayajula, and Sanford Dash of CRAFT Tech for Marshall Space Flight Center. Further information is contained in a TSP (see page 1). Refer to MFS-32442-1.

Parallelization of the Coupled Earthquake Model

NASA's Jet Propulsion Laboratory, Pasadena, California

This Web-based tsunami simulation system allows users to remotely run a model on JPL's supercomputers for a given undersea earthquake. At the time of this reporting, predicting tsunamis on the Internet has never happened before. This new code directly couples the earthquake model and the ocean model on parallel computers and improves simulation speed.

Seismometers can only detect information from earthquakes; they cannot

detect whether or not a tsunami may occur as a result of the earthquake. When earthquake-tsunami models are coupled with the improved computational speed of modern, high-performance computers and constrained by remotely sensed data, they are able to provide early warnings for those coastal regions at risk.

The software is capable of testing NASA's satellite observations of

tsunamis. It has been successfully tested for several historical tsunamis, has passed all alpha and beta testing, and is well documented for users.

This program was written by Gary Block, P. Peggy Li, and Yuhe T. Song of Caltech for NASA's Jet Propulsion Laboratory.

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-44443.