The cylindrical/conical shell enclosing the cavity is machined from copper, which is chosen for its high thermal conductivity. In use, the shell is oriented vertically, open end facing up, and inserted in a Dewar flask filled with isopropyl alcohol/dry-ice slush. A flange at the open end of the shell is supported by a thermally insulating ring on the lip of the Dewar flask. The slush cools the shell (and thus the blackbody cavity) to the desired temperature. Typically, the slush starts at a temperature of about 194 K. The slush is stirred and warmed by bubbling dry air or nitrogen through it, thereby gradually increasing the temperature through the aforementioned calibration range during an interval of several hours. The temperature of the slush is monitored by use of a precise thermocouple probe. A comparison with an independently calibrated commercial radiometer with a thermocouple demonstrated less than a 1 K difference between a thermocouple in the slush and the radiometer’s output. The flow of dry air also acts as a purge to prevent airborne water vapor from frosting the conical and cylindrical cavity surfaces.

This software is an Apache 2.0 module implementing a high-performance map server to support interactive map viewers and virtual planet client software. It can be used in applications that require access to very-high-resolution geolocated images, such as GIS, virtual planet applications, and flight simulators. It serves Web Map Service (WMS) requests that comply with a given request grid from read-only media.

This work was done by Dane Howell, Robert Ryan, Jim Ryan, Doug Henderson, and Larry Clayton of Stennis Space Center.

Inquiries concerning rights for the commercial use of this invention should be addressed to the Intellectual Property Manager, Stennis Space Center, (228) 688-1929. Refer to SSC-00193.

High-Performance Tiled WMS and KML Web Server

NASA’s Jet Propulsion Laboratory, Pasadena, California

This software is an Apache 2.0 module implementing a high-performance map server to support interactive map viewers and virtual planet client software. It can be used in applications that require access to very-high-resolution geolocated images, such as GIS, virtual planet applications, and flight simulators. It serves Web Map Service (WMS) requests that comply with a given request grid from an existing tile dataset. It also generates the KML super-overlay configuration files required to access the WMS image tiles. This server can sustain extremely high request rates with very short request latencies in both WMS and KML protocols. It does not require significant computer resources and can operate from read-only media.

This server makes it possible to support very demanding interactive or immersive applications that require geographically located data. It has direct applications for making NASA data such as remote sensing and modeled or simulated data available to applications like WorldWind or Google Earth.

This program was written by Lucian Plesa 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-44684.

Modeling of Radiative Transfer in Protostellar Disks

NASA’s Jet Propulsion Laboratory, Pasadena, California

This program implements a spectral line, radiative transfer tool for interpreting Spitzer Space Telescope observations by matching them with models of protostellar disks for improved understanding of planet and star formation. The Spitzer Space Telescope detects gaseous phase molecules in the infrared spectra of protostellar disks, with spectral lines carrying information on the chemical composition of the material from which planets form. Input to the software in-