

Linda A. Hunt\*

SSAI/NASA Langley Research Center, Hampton, VA

## 1. INTRODUCTION

The Tropospheric Emission Spectrometer (TES) was launched into a sun-synchronous orbit aboard Aura, the third of NASA's Earth Observing System spacecraft, on July 15, 2004. The primary objective of TES is to make global, three-dimensional measurements of ozone and other chemical species involved in its formation and destruction. The NASA Langley Atmospheric Science Data Center (ASDC) is the archive and distribution center for data from the TES instrument.

## 2. TES INSTRUMENT

The TES instrument is a high-resolution imaging infrared Fourier-transform spectrometer that takes both nadir and limb-sounding measurements. There are two observation modes: global survey and special observations. Global surveys are made for 16 orbits (about 26 hours) every other day. Between global surveys, TES can make special observations using its ability to point at a specific location for a few minutes on any given orbit. This capability is used for targets such as gas-emitting volcanoes, for regional air quality studies, and in conjunction with field campaigns. More information about the TES instrument and ground data system can be found at <http://tes.jpl.nasa.gov>.

The Aura satellite flies in a sun-synchronous orbit at an altitude of 705 km, with an equator crossing time of 1:45 pm local time in the ascending node and an inclination angle of 98.21 degrees. This gives latitudinal coverage from 82N to 82S. There are 233 distinct orbital paths which repeat every 16 days.

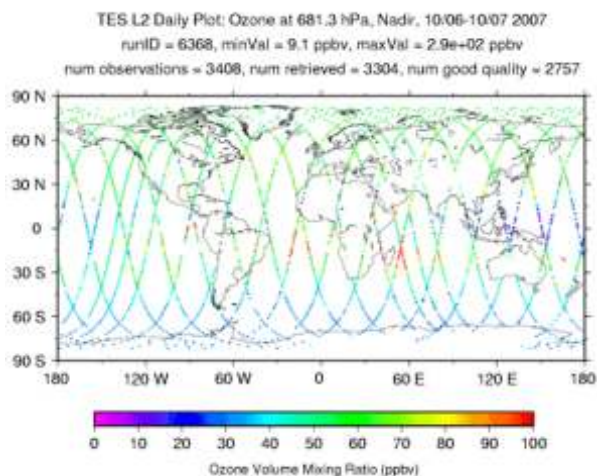
## 3. TES DATA PRODUCTS

### 3.1 Level 1B Products

TES Level 1B data products contain radiometric calibrated spectral radiances and their corresponding noise equivalent spectral radiances (NESR) from nadir and limb views. The geolocation, quality and some engineering data are also provided. These products are written in the NCSA HDF5 format.

### 3.2 Level 2 Products

TES standard Level 2 data products include global-scale vertical profile and total column measurements of ozone, water vapor, HDO, carbon monoxide, methane, and nitric acid for each global survey. Additional products include atmospheric temperature profiles, surface temperatures, and land surface emissivity. The profile data are provided along a uniform UARS pressure grid, ordered from ground to space. A recent reprocessing effort produced a new version of the data which includes additional limb species and a new summary product. Level 2 data files are written in the HDF-EOS5 (based on HDF5) format.

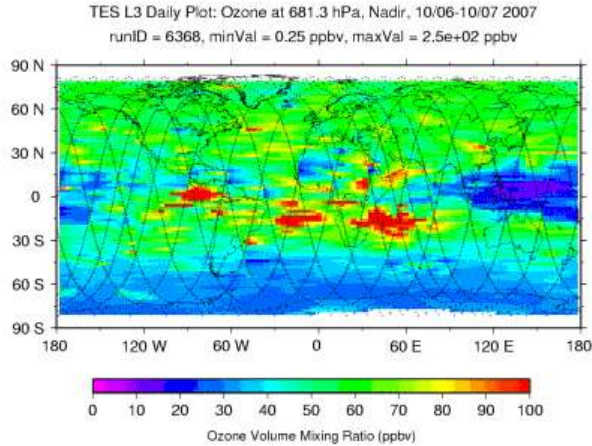


**Figure 1: TES Level 2 Global Survey Nadir Ozone at 681.3 hPa for Global Survey Run 6368 October 6-7, 2007**

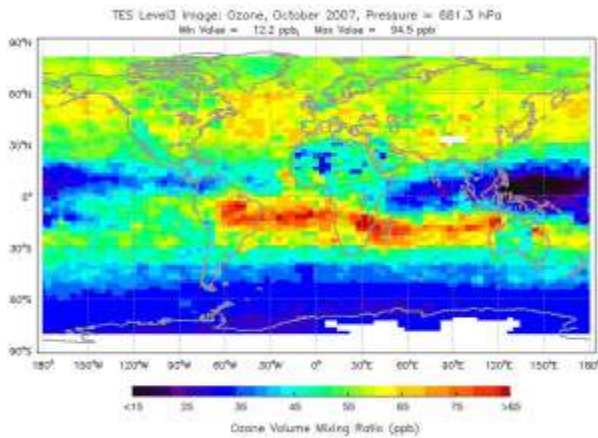
### 3.3 Level 3 Products

In the past year, Level 3 TES products have been released which provide daily and monthly global survey data interpolated (daily) or averaged (monthly) onto a global latitude/longitude grid at selected pressure levels. Browse images for the Level 3 and associated Level 2 data are available with these new Level 3 products. The Level 3 data are also written in the HDF-EOS5 format.

\* *Corresponding author address:* User and Data Services, Atmospheric Science Data Center, NASA Langley Research Center, MS 157D, Hampton, VA 23681-2199; e-mail: [larc@eos.nasa.gov](mailto:larc@eos.nasa.gov)



**Figure 2. TES Level 3 Daily Nadir Ozone at 681.3 hPa for Global Survey Run 6368, October 6-7, 2007**



**Figure 3. TES Level 3 Monthly Nadir Ozone at 681.3 hPa for October, 2007**

#### 4. DATA AND INFORMATION ACCESS

The ASDC TES web page: [http://eosweb.larc.nasa.gov/PRODOCS/tes/table\\_tes.html](http://eosweb.larc.nasa.gov/PRODOCS/tes/table_tes.html) provides information about the available data, services and tools for the TES experiment. Links are provided for data search and order and for direct download from the ASDC Data Pool, an on-line disk cache where Level 2 and Level 3 products are available for one year from delivery. New services, such as subsetting, and new tools, such as visualization software, will be advertised on the web site as they become available.

The ASDC provides data access, services and tools for over 40 projects in the discipline areas of Earth's radiation budget, clouds, aerosols and tropospheric chemistry. Additional information is available from our web site, <http://eosweb.larc.nasa.gov>.

Acknowledgment: Images provided by the NASA/JPL/TES team.

Species	Validation Status
Nadir Ozone	Validated Stage 2
Nadir Carbon Monoxide	Validated Stage 2
Nadir Water (Lower/Middle Troposphere)	Validated Stage 2
Nadir Water (Upper Troposphere)	Validated Stage 2
Nadir Atmospheric Temperature	Validated Stage 2
Sea Surface Temperature	Validated Stage 2
Land Surface Temperature/Emissivity	Provisional
Nadir Methane	Provisional
Nadir HDO	Validated Stage 1
Limb Nitric Acid	Provisional
Limb Ozone	Provisional
Limb Atmospheric Temperature	Provisional
Limb Water	Beta

**Table 1: Validation Status of TES Level 2 and Level 3 Products (maturity level definitions can be found at [http://eosweb.larc.nasa.gov/PRODOCS/misr/Quality\\_Summaries/maturity\\_def.html](http://eosweb.larc.nasa.gov/PRODOCS/misr/Quality_Summaries/maturity_def.html))**