TES Level 2 Versioning

Level 2 Standard and Special Observation Products

Data Set	ESDT		Current Quality Designations
	Global Survey	Special Observation	
TES/Aura L2 CH4 Nadir	TL2CH4N	TL2CH4NS	Validation Status (maturity level defined):
TES/Aura L2 CO Nadir	TL2CON	TL2CONS	
TES/Aura L2 CO2 Lite Nadir	TL2CO2LN		• **Validated Stage 2:** Nadir Ozone, Nadir Carbon Monoxide, Nadir Water (Lower/Middle and Upper Troposphere), Nadir Atmospheric Temperature, Sea Surface Temperature
TES/Aura L2 CO2 Nadir	TL2CO2N	TL2CO2NS	
TES/Aura L2 H2O Nadir	TL2H2ON	TL2H2ONS	
TES/Aura L2 H2O Limb	TL2H2OL		• **Validated Stage 1:** Nadir HDO
TES/Aura L2 HDO Nadir	TL2HDON	TL2HDONS	• **Provisional:** Land Surface Temperature/Emissivity, Nadir Methane, Limb Nitric Acid, Limb Ozone, Limb Atmospheric Temperature
TES/Aura L2 HDO Limb	TL2HDOL		
TES/Aura L2 HNO3 Limb	TL2HNO3L	TL2HNO3S	
TES/Aura L2 NH3 Nadir	TL2NH3N	TL2NH3NS	• **Beta:** Limb Water
TES/Aura L2 O3 Nadir	TL2O3N	TL2O3NS	
TES/Aura L2 O3 Limb	TL2O3L		
TES/Aura L2 Atmospheric Temperatures Nadir	TL2TATMTN	TL2TNS	Quality Summaries:
TES/Aura L2 Atmospheric Temperatures Limb	TL2ATMTL	TL2TLS	• L2 V004 Quality Summary
TES/Aura L2 Ancillary Data	TL2ANC	TL2ANCS	• L2 V003 Quality Summary
TES/Aura L2 Summary Product	TL2SUM	TL2SUMS	• L2 V002 Quality Summary
TES/Aura L2 Supplemental Product	TL2SUP	TL2SUPS	• L2 Beta Release Quality Summary

Version Information	Software Configuration / Product Impact / Quality Transition

• File Version:
  ○ F06_08 (standard product)
  ○ F03_08 (summary product)
  ○ F02_08 (supplemental product)
• ESDT Version: V005
• PGE Version:
  ○ R12.00.00
• Local Version ID:
  ○ L2_Products_Main: R12.00.00
	Data Products Specification V12.0 (PDF)
	
	1. Format changes from previous version:
	  ○ Added Ammonia as a standard product
	  ○ Added CO2 as a standard product
	  ○ Added netCDF dimension: nTimes, nLevels, nLength and nFreq to standard products
	  ○ Changed L2 Ancillary Nadir and Limb data fields from HDO_H2ORatioMeasurementErrorCovariance, HDO_H2OratioSystematicErrorCovariance, HDO_H2ORatioTotalErrorCovariance to HDO_H2OMeasurementErrorCovariance, HDO_H2OObservationErrorCovariance, HDO_H2OTotalErrorCovariance

• File Version:
  ○ F05_07 (standard product)
  ○ F02_07 (summary product)
  ○ F02_07 (supplemental product)
• ESDT Version: V004
• PGE Version:
  ○ R11.01.00
• Local Version ID:
  ○ L2_Products_Main: R11.01.00
	Data Products Specification V11.9 (PDF)
	
	1. Format changes from previous version:
	  ○ Nadir Associated Data Fields Added: AverageCloudEffOpticalDepthError, O3_Ccurve_QA
	  ○ Limb Associated Data Field Added: AverageCloudEffOpticalDepthError
	  ○ Ancillary Data Field Added: SurfaceTempInitialRefined
	  ○ Summary Nadir Associated Field Added: O3_Ccurve_QA

• File Version: F04_04, F01_04 (Summary Product) • ESDT Version: V003 • PGE Version:	Data Products Specification V10.11 (PDF) Quality Transition:

○ R10.0X.0X • Local Version ID: ○ L2_Products_Main: R10.0X.0X	• **Validated Stage 2:** Nadir Ozone, Nadir Carbon Monoxide, Nadir Water (Lower/Middle and Upper Troposphere), Nadir Atmospheric Temperature, Sea Surface Temperature • **Validated Stage 1:** Nadir HDO • **Provisional:** Land Surface Temperature/Emissivity, Nadir Methane, Limb Nitric Acid, Limb Ozone, Limb Atmospheric Temperature • **Beta:** Limb Water

• File Version: F03_02, F03_03
• ESDT Version: V002
• PGE Version:
  ○ R09.0X.0X
• Local Version ID:
  ○ L2_Products_Main: R09.0X.0X
	[Data Products Specification V9.1](#) (PDF)

• File Version: F02_01
• ESDT Version: V001
• PGE Version: R08.02.00
• Local Version ID:
  ○ L2_Products_Main: R08.02.00
	[Data Products Specification V8.0](#) (PDF)
	
	1. Continuing production of TL2ANC, TL2ATMTN, TL2CH4N, TL2CON, TL2H2ON, TL2O3N
	2. Initial release of TL2ANCS, TL2ATMTNS, TL2CH4NS, TL2CONS, TL2H2ONS, TL2O3NS
	3. Format changes from previous version:
	  ○ Nadir Associated Data Fields Deleted: CloudTopHeight
	  ○ Ancillary Nadir Data Fields Deleted: EmmissivityWavenumber, SurfaceElevation, SurfacePressure
	  ○ Nadir Associated Data Fields Added: SpeciesRetrievalQuality, CloudTopPressureError, CloudEffectiveOpticalDepth, CloudEffectiveOpticalDepthError
	  ○ Nadir Geolocation Fields Added: Sequence, Scan, SurfaceTypeFootprint
	  ○ TES Common Metadata Added: Command_Seq_ID, Fix attribute name TAI93at0zOfGranule
	  ○ TES L2 Common Metadata Added: CloudFrequency, EmmissivityWavenumber
	
	Known artifacts/defects:
	
	• Some product granules may not contain Production History information in the file. If data from the Production History is required, please contact the TES Instrument Team via Eugene Chu, TES SCF Manager / SIPS PEM, eugene.chu@jpl.nasa.gov, 818-354-6496.
	• For some Standard product granules, the data fields AveragingKernel, TotalErrorCovariance, MeasurementErrorCovariance, and SystematicErrorCovariance are not reported for some observations (dimension nTimes). The data fields instead have fill data. This affects up to 8% of the observations in the run. The run number is a part of the Local Granule ID (filename) of the product (see [FAQ](#)).

• File Version: F01_01 • ESDT Version: V001 • PGE Version: R07.01.00 • Local Version ID: ○ L2_Products_Main: R07.01.00	[Data Products Specification V7.0](#) (PDF) 1. Initial release of TL2ANC, TL2ATMTN, TL2CH4N, TL2CON, TL2H2ON, TL2O3N **Known artifacts/defects:** • For R7, TES L2 Products that are ready for scientific use are the nadir retrievals of ozone, carbon monoxide, methane, temperature and water for ocean target scenes only. Ocean target scenes can be determined by comparing the Latitude and Longitude data fields of the observation to a land/water map. If such a map is not available, observations where the Geolocation data field SurfaceElevStandardDeviation = 0.0 can be identified as ocean. • In order to compare TES profile data with other measurements, vertical smoothing and sensitivity must be accounted for by applying the AveragingKernel data field. The error estimates included in the L2 data products such as TotalErrorCovariance, MeasurementErrorCovariance, and SystemErrorCovariance are meaningful based on the current validation analysis. As a means of accounting for systematic errors in L1B radiances, current L2 profiles include the retrieval of a calibration scaling parameter, the data field ConstraintVector. • The Pressure data field in each species product contains standard

pressures for levels below the surface level. They should be fill values. The user is advised to look at another of the Primary data fields, such as Altitude, to determine the nLevels index of the surface, which is the first non-fill value.

- The data field SpeciesRetrievalConverged is underreported due to convergence criteria that are currently set too strictly.
- The Ancillary Nadir data field LandSurfaceEmissivity is incorrectly filled in (by initial guess values) for ocean scenes and should be ignored for these scenes. Ocean scenes can be identified by Geolocation data field SurfaceElevStandardDeviation = 0.0.
- The data field CloudTopHeight is obsolete and contains a fill value.
- The data field CloudTopPressure is sometimes reported as a value greater than the surface pressure (from the Pressure data field). These locations should be interpreted as being cloud-free.
- For the Ancillary Product TL2ANC the following data fields should be ignored:
    - SurfacePressure: Contains a fill value.
    - SurfaceElevation: Contains values that should not be used.
- For specific Standard product granules, with the run numbers listed below, the data fields AveragingKernel, TotalErrorCovariance, MeasurementErrorCovariance, and SystematicErrorCovariance are not reported for all observations (dimension nTimes). For some runs (other than those listed below), some percentage of the observations are missing these data fields. The data fields instead have fill data. The run number is a part of the Local Granule ID (filename) of the product (see FAQ).

• 2439	• 2501	• 2668	• 3138	• 3153
• 2443	• 2506	• 2695	• 3141	• 3156
• 2448	• 2619	• 2801	• 3144	• 3158
• 2476	• 2630	• 3023	• 3149	• 3160
• 2481	• 2649	• 3070	• 3151	• 3163