MABEL_L1A Product Data Dictionary

Date Generated : 2014-07-03T14:39:41.000000Z
Product Type: MABEL_L1A, Format Version : SET_BY_PGE

Group: /		
h5es_id	(Attribute)	1
granule_type	(Attribute)	mabel_l1a
short_name	(Attribute)	mabel_l1a
level	(Attribute)	L1A
description	(Attribute)	MABEL TOF, HK, and STA data decommutated into HDF5 format.
citation	(Attribute)	The data used in this study were produced by the ICESat-2 Science Project Office (PSO) at NASA/GSFC. The data archive site is the PSO.
comment	(Attribute)	Data granules consist of approximately 1 minute of HDF5 data and include decommutated raw MABEL data in engineering units reformatted into HDF5. Some parameters are converted for data handling and ordering.
contributor_name	(Attribute)	William B Cook (william.b.cook@nasa.gov), Thomas E Neumann (thomas.neumann@nasa.gov), Thorsten Markus (thorsten.markus@nasa.gov), David W Hancock III (david.w.hancock@nasa.gov), Jeffrey E Lee (jeffrey.e.lee@nasa.gov)
contributor_role	(Attribute)	Instrument Engineer, Investigator, Principle Investigator, Data Producer, Data Producer
Conventions	(Attribute)	CF-1.6
creator_email	(Attribute)	David.W.Hancock@nasa.gov
creator_name	(Attribute)	ICESat-2 Science Investigator-led Processing System (ISIPS)
date_created	(Attribute)	SET_BY_PGE
date_type	(Attribute)	J2000
featureType	(Attribute)	trajectory
flight_location	(Attribute)	SET_BY_PGE
flight_number	(Attribute)	SET_BY_PGE
geospatial_lat_max	(Attribute)	0.0000000000000000
geospatial_lat_min	(Attribute)	0.0000000000000000
geospatial_lat_units	(Attribute)	degrees_north
geospatial_lon_max	(Attribute)	0.0000000000000000
geospatial_lon_min	(Attribute)	0.0000000000000000
geospatial_lon_units	(Attribute)	degrees_east
hdfversion	(Attribute)	SET_BY_PGE
history	(Attribute)	SET_BY_PGE
identifier_file_uuid	(Attribute)	SET_BY_PGE
identifier_product_doi	(Attribute)	TBD
identifier_product_doi_authority	(Attribute)	http://dx.doi.org
identifier_product_format_version	(Attribute)	SET_BY_PGE
identifier_product_type	(Attribute)	MABEL_L1A
institution	(Attribute)	National Aeronautics and Space Administration (NASA)
instrument	(Attribute)	Multiple Altimeter Beam Experimental Lidar (MABEL)
keywords	(Attribute)	Earth Science > Spectral/Engineering > Infrared Wavelengths > Sensor Counts > Photons
keywords_vocabulary	(Attribute)	GCMD Science Keywords Version 6.0
license	(Attribute)	Data may not be reproduced or distributed without including the citation for this product included in this metadata. Data may not be distributed in an altered form without the written permission of the ICESat-2 Science Project Office at NASA/GSFC.
naming_authority	(Attribute)	http://dx.doi.org
platform	(Attribute)	SET_BY_PGE
processing_level	(Attribute)	L1A
project	(Attribute)	Multiple Altimeter Beam Experimental Lidar (MABEL)
publisher_email	(Attribute)	thomas.neumann@nasa.gov
publisher_name	(Attribute)	ICESat-2 Project Science Office (PSO) at NASA/GSFC.
publisher_url	(Attribute)	http://icesat.gsfc.nasa.gov/icesat2/data/mabel/data/browse/index.html
references	(Attribute)	http://icesat.gsfc.nasa.gov/icesat2/data/mabel/mabel_docs.php (Documentation set for this product at the ICESat-2 Website), http://icesat.gsfc.nasa.gov/icesat2/data/mabel/data/browse/index.html (Browse data for MABEL at the ICESat-2 Website)
source	(Attribute)	Aircraft measurements
spatial_coverage_type	(Attribute)	Horizontal
standard_name_vocabulary	(Attribute)	CF-1.6
summary	(Attribute)	The reformatted data are use to create the converted data products. Each MABEL_L1A granule was created from a time span of corresponding MABEL raw time-of-flight, status and housekeeping files. The provenance metadata shows the history that created the granule.
time_coverage_duration	(Attribute)	SET_BY_PGE
time_coverage_end	(Attribute)	SET_BY_PGE

time_coverage_end	(Attribute)	SET_BY_PGE		
time_coverage_start	(Attribute)	SET_BY_PGE		
time_type	(Attribute)	CCSDS UTC-A		
title	(Attribute)	MABEL L1A Reformatted Data (HDF5)		
Group: /ancillary_data				
h5es_id	(Attribute)	2		
Description	(Attribute)	Contains information ancillary to the data product. This may include product characteristics, instrument characteristics and/or processing constants.		
data_rate	(Attribute)	Parameters in this group are single-instances valid for the entire file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
control (Compact Dataset)	STRING:4096 (1)	Control File (not_set)	not_set Operations	PGE-specific control file used to generate this granule. To re-use, replace breaks (BR) with linefeeds.
data_end_gpssow (Compact Dataset)	DOUBLE (1)	Ending GPS Seconds-of-Week (not_set)	seconds Derived	GPS seconds-of-week for the last data point in the granule. (not referenced to granule_gps_epoch)
data_end_gpsweek (Compact Dataset)	INTEGER_4 (1)	Ending GPSWeek (not_set)	weeks Derived	GPS week number for the last data point in the granule. (not referenced to granule_gps_epoch)
data_end_utc (Compact Dataset)	STRING:27 (1)	End UTC (not_set)	not_set Derived	UTC (in CCSDS-A format) of the last data point within the granule. (not referenced to granule_gps_epoch)
data_start_gpssow (Compact Dataset)	DOUBLE (1)	Starting GPS Seconds-of-Week (not_set)	seconds Derived	GPS seconds-of-week for the first data point in the granule. (not referenced to granule_gps_epoch)
data_start_gpsweek (Compact Dataset)	INTEGER_4 (1)	Starting GPSWeek (not_set)	weeks since 1980-01-06T00:00:00Z Derived	GPS week number for the first data point in the granule. (not referenced to granule_gps_epoch)
data_start_utc (Compact Dataset)	STRING:27 (1)	Actual Start UTC of Granule (not_set)	not_set Derived	UTC (in CCSDS-A format) of the first data point within the granule. (not referenced to granule_gps_epoch)
end_latitude (Compact Dataset)	DOUBLE (1)	Ending Latitude (not_set)	degrees_north Derived	Best-available latitude (product-specific) in degrees at last data point within the granule.
end_longitude (Compact Dataset)	DOUBLE (1)	Ending Longitude (not_set)	degrees_east Derived	Best-available longitude (product-specific) in degrees at last data point within the granule.
granule_end_utc (Compact Dataset)	STRING:27 (1)	Ending Time of Granule (not_set)	not_set Derived	Requested end time (UTC CCSDS-A) of this granule.
granule_gps_epoch (Contiguous Dataset)	DOUBLE (1)	Elapsed GPS Seconds (not_set)	seconds since 1980-01-06T00:00:00.000000Z Derived	Number of GPS seconds since GPS epoch (1980-01-06T00:00:00.000000Z UTC) corresponding to the requested start time of the granule. Add this value to the data [delta_time] parameter to compute [gps_seconds] for each data point.
granule_start_utc (Compact Dataset)	STRING:27 (1)	Requested Start Time of Granule (not_set)	not_set Derived	Requested start time (UTC CCSDS-A) of this granule.
release (Compact Dataset)	STRING:80 (1)	Release Number (not_set)	not_set Operations	This identifies the release number of the granule. The release number is incremented when the software or ancillary data used to create the granule has been changed.
start_latitude (Compact Dataset)	DOUBLE (1)	Starting Latitude (not_set)	degrees_north Derived	Best-available latitude (product-specific) in degrees at first data point within the granule (corresponds to data_start_utc).
start_longitude (Compact Dataset)	DOUBLE (1)	Starting Longitude (not_set)	degrees_east Derived	Best-available longitude (product-specific) in degrees at first data point within the granule (corresponds to data_start_utc).
version (Compact Dataset)	STRING:80 (1)	Version (not_set)	counts Operations	This identifies the version number of this granule within the release. It is a sequential number corresponding to the number of times the granule has been reprocessed for the current release.
Group: /ancillary_data/general				
h5es_id	(Attribute)	3		
Description	(Attribute)	Contains general ancillary parameters.		
data_rate	(Attribute)	Parameters in this group are single-instances valid for the entire file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
mab_clock_freq (Compact Dataset)	FLOAT (1)	Clock Frequency (not_set)	hertz MABEL Engineering Docs	Nominal MABEL clock frequency.
mab_fcell_conv (Compact Dataset)	FLOAT (1)	Fractional Cell Conversion Factor (not_set)	ns MABEL Engineering Docs	MABEL fractional cell conversion factor.
mab_range_conv (Compact Dataset)	FLOAT (1)	Range Conversion Factor (not_set)	ns MABEL Engineering Docs	MABEL range conversion factor.
Group: /flight_parameters				
h5es_id	(Attribute)	4		
Description	(Attribute)	Contains flight/scenario characteristics derived from information provided by the MABEL instrument team.		
data_rate	(Attribute)	Parameters in this group are single-instances valid for the entire file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
angle_1064_mrad (Compact Dataset)	FLOAT (50)	1064 Angle (not_set)	mrad Ancillary Scenario File	Angle of each 1064 connector

(Compact Dataset)	(50)	(not_set)	Ancillary Scenario File	
angle_532_mrad (Compact Dataset)	FLOAT (50)	532 Angle (not_set)	mrad Ancillary Scenario File	Angle of each 532 connector
channel_1064 (Compact Dataset)	INTEGER_4 (50)	1064 Channel Numbers (not_set)	counts Ancillary Scenario File	Channel number for each 1064 channel
channel_1064_flag (Compact Dataset)	INTEGER_4 (50)	1064 Channel Flag (not_set)	counts Ancillary Scenario File	Channel flag (0=processed, 1=skipped)
channel_532 (Compact Dataset)	INTEGER_4 (50)	532 Channel Numbers (not_set)	counts Ancillary Scenario File	Channel number for each 532 channel
channel_532_flag (Compact Dataset)	INTEGER_4 (50)	532 Channel Flag (not_set)	counts Ancillary Scenario File	Channel flag (0=processed, 1=skipped)
comments (Compact Dataset)	STRING:255 (1)	Flight Comments (not_set)	not_set Ancillary Flight File	Comments from the MABEL flight team
connector_1064 (Compact Dataset)	INTEGER_4 (50)	1064 Connector Numbers (not_set)	counts Ancillary Scenario File	Connector number for each 1064 channel
connector_532 (Compact Dataset)	INTEGER_4 (50)	532 Connector Numbers (not_set)	counts Ancillary Scenario File	Connector number for each 532 channel
ds_pulse_shape (Contiguous Dataset)	INTEGER_1 (20)	Pulse Shape Index (not_set)	ns MABEL Flight Team	index of the Transmit Pulse Shape (tx_pulse_shape_x)
ds_tof_port (Contiguous Dataset)	INTEGER_1 (50)	TOF channel port (not_set)	not_set not_set	Dimension scale for TOF channels.
elevation_1064_mrad (Compact Dataset)	FLOAT (50)	1064 Elevation (not_set)	mrad Ancillary Scenario File	Elevation for each 1064 connector (mrad)
elevation_532_mrad (Compact Dataset)	FLOAT (50)	532 Elevation (not_set)	mrad Ancillary Scenario File	Elevation for each 532 connector (mrad)
fiber_1064 (Compact Dataset)	INTEGER_4 (50)	1064 Fiber Numbers (not_set)	counts Ancillary Scenario File	Fiber number for each 1064 channel
fiber_532 (Compact Dataset)	INTEGER_4 (50)	532 Fiber Numbers (not_set)	counts Ancillary Scenario File	Fiber number for each 532 channel
filt_energy_1064_u (Compact Dataset)	FLOAT (50)	1064 Filtered Energy (not_set)	uJ Ancillary Scenario File	Filtered energy for each 1064 channel (uJ)
filter_1064 (Compact Dataset)	FLOAT (50)	1064 Filter per Channel (not_set)	mm Ancillary Scenario File	Filter for each 1064 channel
filter_532 (Compact Dataset)	FLOAT (50)	532 Filter per Channel (not_set)	mm Ancillary Scenario File	Filter for each 532 channel
filter_density_1064 (Compact Dataset)	FLOAT (2)	1064 Filter Density (not_set)	counts Ancillary Scenario File	Density of the 1064 filters
filter_density_532 (Compact Dataset)	FLOAT (2)	532 Filter Density (not_set)	counts Ancillary Scenario File	Density of the 532 filters
filter_size_1064 (Compact Dataset)	FLOAT (2)	1064 Filter Size (not_set)	mm Ancillary Scenario File	Size of 1064 filter(s)
filter_size_532 (Compact Dataset)	FLOAT (2)	532 Filter Size (not_set)	mm Ancillary Scenario File	Size of 532 filter(s)
filtered_energy_532_u (Compact Dataset)	FLOAT (50)	532 Filtered Energy (not_set)	uJ Ancillary Scenario File	Filtered energy for each 532 channel (uJ)
flight_end_utc (Compact Dataset)	STRING:28 (1)	Ending Time of Flight (not_set)	not_set Ancillary Flight File	UTC stop time of the flight in CCSDS-A format
flight_location (Compact Dataset)	STRING:255 (1)	Flight Location (not_set)	counts Ancillary Flight File	Primary location of the flight
flight_number (Contiguous Dataset)	INTEGER_4 (1)	Flight Number (not_set)	counts Ancillary Flight File	Incremental flight number
flight_start_utc (Compact Dataset)	STRING:28 (1)	Start Time of Flight (not_set)	not_set Ancillary Flight File	UTC start time of the flight in CCSDS-A format
flight_version (Compact Dataset)	STRING:80 (1)	Flight File Version (not_set)	counts Ancillary Flight File	Version number of the ancillary flight file.
gps_rate (Compact Dataset)	INTEGER_4 (1)	GPS Rate (not_set)	hertz Ancillary Flight File	Data rate of the GPS (Hz)
imu_bias (Compact Dataset)	DOUBLE (3)	IMU Bias (not_set)	mrad Ancillary Scenario File	IMU bias coefficients (IMU to vehicle frame); roll, pitch, yaw (mrad)
imu_rate (Compact Dataset)	INTEGER_4 (1)	IMU Rate (not_set)	hertz Ancillary Flight File	Data rate of the IMU (Hz)
label (Compact Dataset)	STRING:255 (1)	Flight Label (not_set)	not_set Ancillary Flight File	Unique label associated with the flight
laser_rate (Compact Dataset)	INTEGER_4 (1)	Laser Rate (not_set)	hertz Ancillary Flight File	Data rate of the Laser (Hz)
mab_bias_1064 (Compact Dataset)	DOUBLE (3)	MABEL Bias 1064 (not_set)	mrad Ancillary Scenario File	1064 MABEL bias coefficients (MABEL frame to IMU); roll, pitch, heading (mrad)
mab_bias_532 (Compact Dataset)	DOUBLE (3)	MABEL Bias 532 (not_set)	mrad Ancillary Scenario File	532 MABEL bias coefficients (MABEL frame to IMU); roll, pitch, heading (mrad)
mab_imu_off (Compact Dataset)	DOUBLE (3)	MABEL IMU Offset (not_set)	mrad Ancillary Scenario File	IMU origin ofsets; roll, pitch, heading (mrad)
mab_lrp_off (Compact Dataset)	DOUBLE (3)	MABEL Laser Reference Point Offset (not_set)	mrad Ancillary Scenario File	Laser reference point offsets; roll, pitch, heading (mrad)
num_channels_1064	INTEGER_4	Number of 1064 Channels	counts	Number of 1064 channels present during the flight.

(Compact Dataset)	(1)	(not_set)	Derived	
num_channels_532 (Compact Dataset)	INTEGER_4 (1)	Number of 532 channels (not_set)	counts Derived	Number of 532 channels present during the flight.
num_filter_1064 (Compact Dataset)	INTEGER_4 (1)	Number of 1064 Filters (not_set)	counts Derived	Number of 1064 filters present during the flight.
num_filter_532 (Compact Dataset)	INTEGER_4 (1)	Number of 532 filters (not_set)	counts Derived	Number of 532 filters present during the flight.
num_poi (Compact Dataset)	INTEGER_4 (1)	Number of POIs (not_set)	counts Ancillary Flight File	Number of points-of-interest for the flight
offset2_on_ground_1064_m (Compact Dataset)	FLOAT (50)	1064 Offset 2 (not_set)	m Ancillary Scenario File	Pitch offset on ground for each 1064 channel (m)
offset2_on_ground_532_m (Compact Dataset)	FLOAT (50)	532 Offset 2 (not_set)	m Ancillary Scenario File	Pitch offset on ground for each 532 channel (m)
offset_on_ground_1064_m (Compact Dataset)	FLOAT (50)	1064 Offset (not_set)	m Ancillary Scenario File	Roll offset on ground for each 1064 channel (m)
offset_on_ground_532_m (Compact Dataset)	FLOAT (50)	532 Offset (not_set)	m Ancillary Scenario File	Roll offset on ground of each 532 channel (m)
path_length_1064_mm (Compact Dataset)	FLOAT (50)	1064 Path Length (not_set)	mm Ancillary Scenario File	Path length for each 1064 fiber (mm)
path_length_532_mm (Compact Dataset)	FLOAT (50)	532 Path Length (not_set)	mm Ancillary Scenario File	Path length for each 532 fiber (mm)
platform_longname (Compact Dataset)	STRING:255 (1)	Platform Longname (not_set)	not_set Ancillary Scenario File	Long name of platform (aircraft) carrying the MABEL instrument.
platform_shortname (Compact Dataset)	STRING:255 (1)	Platform Shortname (not_set)	not_set Ancillary Scenario File	Short name of platform (aircraft) carrying the MABEL instrument.
point_of_interest (Compact Dataset)	STRING:255 (1)	Point of Interest (not_set)	not_set Ancillary Flight File	Points of interest identified by the mabel flight team
power_1064_mw (Compact Dataset)	FLOAT (50)	1064 Power (not_set)	mW Ancillary Scenario File	Power for each 1064 channel (mW)
power_532_mw (Compact Dataset)	FLOAT (50)	532 Power (not_set)	mW Ancillary Scenario File	Power for each 532 channel (mW)
raw_energy_1064_u (Compact Dataset)	FLOAT (50)	1064 Raw Energy (not_set)	uJ Ancillary Scenario File	Raw energy for each 1064 channel (uJ)
raw_energy_532_u (Compact Dataset)	FLOAT (50)	532 Raw Energy (not_set)	uJ Ancillary Scenario File	Raw energy for each 532 channel (uJ)
rec_power_1064_mw (Compact Dataset)	FLOAT (50)	1064 Received Power (not_set)	mW Ancillary Scenario File	Received power for each 1064 channel (mW)
rec_power_532_mw (Compact Dataset)	FLOAT (50)	532 Received Power (not_set)	mW Ancillary Scenario File	Received power for each 532 channel (mW)
reference_channel_1064 (Compact Dataset)	INTEGER_4 (1)	1064 Reference Channel (not_set)	counts Ancillary Scenario File	Representative channel for 1064
reference_channel_532 (Compact Dataset)	INTEGER_4 (1)	532 Reference Channel (not_set)	counts Ancillary Scenario File	Representative channel for 532
scenario_number (Contiguous Dataset)	INTEGER_4 (1)	Scenario Number (not_set)	counts Ancillary Flight File	Associated mabel configuration scenario number
scenario_utc_time (Compact Dataset)	STRING:17 (1)	Start Time of Scenario (not_set)	not_set Ancillary Scenario File	UTC start time of the scenario in CCSDS-A format
scenario_version (Compact Dataset)	STRING:80 (1)	Scenario Version (not_set)	not_set Ancillary Scenario File	Version number of the ancillary scenario file
transmit_efficiency_1064 (Compact Dataset)	FLOAT (50)	Transmit Efficiency 532 (not_set)	percent MABEL Flight Team	The laboratory-measured efficiency of the transmit path, for each beam, from the point the transmit power was measured to its output point from MABEL.
transmit_efficiency_532 (Compact Dataset)	FLOAT (50)	Transmit Efficiency 532 (not_set)	percent MABEL Flight Team	The laboratory-measured efficiency of the transmit path, for each beam, from the point the transmit power was measured to its output point from MABEL.
tx_pulse_shape_1064 (Compact Dataset)	FLOAT (20)	Transmit Pulse Shape 1064 (not_set)	ns MABEL Flight Team	The laboratory-measured shape of the 1064 Transmit Pulse. Values are provided every 0.5 ns.
tx_pulse_shape_532 (Compact Dataset)	FLOAT (20)	Transmit Pulse Shape 532 (not_set)	ns MABEL Flight Team	The laboratory-measured shape of the 532 Transmit Pulse. Values are provided every 0.5 ns.
Group: /housekeeping				
h5es_id	(Attribute)	5		
Description	(Attribute)	Housekeeping packet data		
data_rate	(Attribute)	Parameters in this group are at the data rate of the L0 HouseKeeping packet (nominally 1hz)		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
ds_advoltage_thermistor (Contiguous Dataset)	INTEGER_4 (32)	Array index for advoltage_thermistor (not_set)	counts Derived	Array index for advoltage_thermistor flag_values: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 flag_meanings : th1 th2 th3 th4 th5 th6 th7 th8 th9 th10 th11 th12 th13 th14 th15 th16 th17 th18 th19

				th20 th21 th
ds_currentsector_byte (Contiguous Dataset)	INTEGER_4 (6)	Array index for currentsector_byte (not_set)	counts Derived	Array index for currentsector_byte
ds_etalontemperatures_thermistor (Contiguous Dataset)	INTEGER_4 (3)	Array index for etalontemperature (not_set)	counts Derived	Array index for etalontemperature flag_values: 1, 2, 3 flag_meanings : et1 et2 et3
ds_laserenergy (Contiguous Dataset)	INTEGER_4 (2)	Array index for laser energy (not_set)	counts Derived	Array index for laser energy flag_values: 1, 2 flag_meanings : green red
ds_lasertemperature_thermistor (Contiguous Dataset)	INTEGER_4 (6)	Array index for lasertemperature (not_set)	counts Derived	Array index for lasertemperature flag_values: 1, 2, 3, 4, 5, 6 flag_meanings : th1 th2 th3 th4 th5 th6
ds_pid_temperature_thermistor (Contiguous Dataset)	INTEGER_4 (4)	Array index for pid_temperatures (not_set)	counts Derived	Array index for pid_temperatures flag_values: 1, 2, 3, 4 flag_meanings : th1 th2 th3 th4
ds_proportionalvalvevoltage_thermistor (Contiguous Dataset)	INTEGER_4 (2)	Array index for proportionalvalvevoltage (not_set)	counts Derived	Array index for proportionalvalvevoltage flag_values: 1, 2 flag_meanings : th1 th2
hk_advoltages (Chunked Dataset)	FLOAT (32, UNLIMITED)	thermistor temperatures (not_set)	degrees C Derived : ADVoltages= (81.6323*ADVoltages)+259.683	Array of 32 thermistor temperatures (see MABEL Users Guide)
hk_altitude (Chunked Dataset)	FLOAT (UNLIMITED)	altitude (not_set)	meters L0 HK Packet	GPS reported altitude.
hk_badcommandcount (Chunked Dataset)	INTEGER_4 (UNLIMITED)	bad command count (not_set)	counts L0 HK Packet	Number of bad commands received by the instrument.
hk_controlstate (Chunked Dataset)	INTEGER_4 (UNLIMITED)	control state (not_set)	counts L0 HK Packet	The operating mode the instrument software is in.
hk_controlsubmode (Chunked Dataset)	INTEGER_4 (UNLIMITED)	control submode (not_set)	counts L0 HK Packet	The submode of the operating mode.
hk_detectorvoltage (Chunked Dataset)	FLOAT (UNLIMITED)	detector voltage (not_set)	volts L0 HK Packet	The voltage supplied to the detector.
hk_etalonsetpoint (Chunked Dataset)	FLOAT (UNLIMITED)	etalon set point (not_set)	degrees C L0 HK Packet	Etalon Set Point
hk_etalontemperatures (Chunked Dataset)	FLOAT (3, UNLIMITED)	etalon temperatures (not_set)	degrees C L0 HK Packet	Array of 3 etalon temperatures
hk_goodcommandcount (Chunked Dataset)	INTEGER_4 (UNLIMITED)	good command count (not_set)	counts L0 HK Packet	Number of good commands received by the instrument.
hk_gps_sow (Chunked Dataset)	FLOAT (UNLIMITED)	GPS seconds-of-week (not_set)	seconds L0 HK Packet (scaled from ms to s)	The GPS reported seconds-of-week.
hk_gpsweek (Chunked Dataset)	INTEGER_4 (UNLIMITED)	GPS week (not_set)	weeks L0 HK Packet	The GPS reported week number.
hk_laserenergy (Chunked Dataset)	FLOAT (2, UNLIMITED)	laser energy (not_set)	watts L0 HK Packet	Laser Energy Monitor reading; 1=green, 2=red
hk_lasergoalstate (Chunked Dataset)	UINT_1_LE (UNLIMITED)	laser goal state (not_set)	counts L0 HK Packet	The state the software wants the laser to be in.
hk_laserstate (Chunked Dataset)	UINT_1_LE (UNLIMITED)	laser state (not_set)	counts L0 HK Packet	The current state the laser is in.
hk_laserstatus_1 (Chunked Dataset)	UINT_1_LE (UNLIMITED)	laser status 1 (not_set)	counts L0 HK Packet	Fault bits: 0=OSC temp; 1=AMP1 temp; 2=AMP2 temp; 3-AMP3 temp; 4=unused; 5=SGH temp; 6=OSC over current; 7=AMP over current
hk_laserstatus_2 (Chunked Dataset)	UINT_1_LE (UNLIMITED)	LaserStatus_2 (not_set)	counts L0 HK Packet	Bits: 0=unused; [12]=[00]Sleep, [01]STANDBY, [10]Ready, [11]Fire; 3=flow fault; 4=ARM active; 5=Bad Packet Chksum; 6=Invalid CMD; 7=unused
hk_laserstatus_runtime (Chunked Dataset)	INTEGER_4 (UNLIMITED)	laser status runtime (not_set)	seconds L0 HK Packet	Accumulated laser run time in seconds.
hk_lasertemperature (Chunked Dataset)	FLOAT (6, UNLIMITED)	laser temperature (not_set)	degrees C L0 HK Packet	Array of 6 laser temperatures. For data after 02/2012, the 6th element is VBGLaserTemperature.
hk_latitude (Chunked Dataset)	FLOAT (UNLIMITED)	latitude (latitude)	degrees_north L0 HK Packet (scaled by 100)	GPS Reported Latitude. North is positive
hk_longitude (Chunked Dataset)	FLOAT (UNLIMITED)	longitude (longitude)	degrees_east L0 HK Packet (scaled by 100)	GPS reported longitude. West is negative
hk_pidtemperatures (Chunked Dataset)	FLOAT (4, UNLIMITED)	pid temperature (not_set)	degrees C L0 HK Packet	Array of temperature readings from the PID controllers. 1=unused; 2=unused; 3=unused; 4=fluid loop temp.
hk_proportionalvalvevoltage (Chunked Dataset)	FLOAT (2, UNLIMITED)	proportional valve voltages (not_set)	volts L0 HK Packet	Array of 2 control voltages supplied to the proportional valves.
hk_pumpenablevoltage (Chunked Dataset)	FLOAT (UNLIMITED)	pump enable voltage (not_set)	volts L0 HK Packet	The voltage supplied to turn on the cooling fluid pump.
hk_reprate (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Repetition Rate (not_set)	hertz L0 HK Packet	The current repetition rate of the laser.
hk_tof1_currentsector (Chunked Dataset)	UINT_1_LE (6, UNLIMITED)	TOF1 current sector (not_set)	counts L0 HK Packet	(Array of 6 bytes) The current sector that the TOF1 card will write to.
hk_tof1_gps_sow (Chunked Dataset)	FLOAT (UNLIMITED)	TOF1 gps seconds of week (not_set)	seconds L0 HK Data (scaled from ms to s)	The GPS seconds-of-week reported by the TOF1 card.

hk_tof1_gpsweek (Chunked Dataset)	INTEGER_4 (UNLIMITED)	TOF1 gps week (not_set)	weeks L0 HK Packet	GPS week reported by the TOF1 card.
hk_tof1_overview (Chunked Dataset)	UINT_1_LE (UNLIMITED)	TOF1 CardOverview (not_set)	counts L0 HK Packet	Register bits: 0=channel (0=low,1=hi); 1=collecting data; 2=ready go in; 3=serial port; 4=temp sens SMB err; 5=SP watchdog err; 6=unused; 7=mem buff ready
hk_tof1_shotcounter (Chunked Dataset)	INTEGER_4 (UNLIMITED)	TOF1 shot counter (not_set)	counts L0 HK Packet	The shot counter of the TOF1 card. This indicates how many laser shots the card has seen.
hk_tof2_currentsector (Chunked Dataset)	UINT_1_LE (6, UNLIMITED)	TOF2 current sector (not_set)	counts L0 HK Packet	(Array of 6 bytes) The current sector that the TOF2 card will write to.
hk_tof2_gps_sow (Chunked Dataset)	FLOAT (UNLIMITED)	TOF2 gps seconds of week (not_set)	seconds L0 HK Packet (scaled from ms to s)	The GPS seconds-of-week reported by the TOF2 card.
hk_tof2_gpsweek (Chunked Dataset)	INTEGER_4 (UNLIMITED)	TOF2 gps week (not_set)	weeks since 1980-01-06T00:00:00Z L0 HK Packet	GPS week reported by the TOF2 card.
hk_tof2_overview (Chunked Dataset)	UINT_1_LE (UNLIMITED)	TOF2 CardOverview (not_set)	counts L0 HK Packet	Register bits: 0=channel (0=low,1=hi); 1=collecting data; 2=ready go in; 3=serial port; 4=temp sens SMB err; 5=SP watchdog err; 6=unused; 7=mem buff ready
hk_tof2_shotcounter (Chunked Dataset)	INTEGER_4 (UNLIMITED)	TOF2 shot counter (not_set)	counts L0 HK Packet	The shot counter of the TOF2 card. This indicates how many laser shots the card has seen.
hk_tofcardseenmask (Chunked Dataset)	UINT_1_LE (UNLIMITED)	TOF card seen mask (not_set)	counts L0 HK Packet	Bits indicate from which TOF card we are receiving data. Bits: 0=TOF1; 1=TOF2; 2=unused; 3=CPU HD seen; 4=TOF1 HD seen; 5=TOF2 HD seen; 6=set using PC time; 7=set using GPS time.
Group: /quality_assessment				
h5es_id	(Attribute)	6		
Description	(Attribute)	Contains quality assessment data. This may include QA counters, QA along-track data and/or QA summary data.		
data_rate	(Attribute)	Parameters in this group at the data rate defined in each quality_assessment subgroup.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
ds_packet_counts (Contiguous Dataset)	INTEGER_4 (6)	Dimension scale for QA counters (not_set)	counts Derived (QA)	Packet count statistics array index flag_values: 1, 2, 3, 4, 5, 6 flag_meanings : total skipped used split duplicate expected
ds_statistics (Contiguous Dataset)	INTEGER_4 (5)	Dimension scale for QA statistics (not_set)	counts Derived (QA)	QA statistics array index flag_values: 1, 2, 3, 4, 5 flag_meanings : number_of_points minimum maximum average standard_deviation
Group: /quality_assessment/along_track				
h5es_id	(Attribute)	7		
Description	(Attribute)	Along-track statistics		
data_rate	(Attribute)	Parameters in this group at 0.1Hz.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time_end (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time End (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Exclusive elapsed time at the end of each (or the) data segment, referenced to granule_gps_epoch.
delta_time_start (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time Start (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Inclusive elapsed time at the start of each (or the) data segment, referenced to granule_gps_epoch.
qa_at_cell_delay (Chunked Dataset)	DOUBLE (5, UNLIMITED)	Statistics for cell delay average. (not_set)	counts Derived (QA)	Along-track statistics for celldelay_average. Values are in the order number_of_points, minimum, maximum, average, standard_deviation.
qa_at_nshots (Chunked Dataset)	INTEGER_4 (UNLIMITED)	Number of shots (not_set)	counts Derived (QA)	The number of shots in the along-track interval.
Group: /quality_assessment/along_track/channel				
h5es_id	(Attribute)	56		
Description	(Attribute)	Contains along-track statistics for this channel		
data_rate	(Attribute)	Parameters in this group at 0.1Hz.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
qa_at_nranges (Chunked Dataset)	INTEGER_4 (UNLIMITED)	Number of ranges (not_set)	counts Derived (QA)	The number of ranges for this channel in the along-track interval.
qa_at_pps (Chunked Dataset)	DOUBLE (UNLIMITED)	QA Along-Track Photons-Per-Shot (not_set)	counts Derived (QA)	Number of photons/shot in the interval
Group: /quality_assessment/packet_counts				
h5es_id	(Attribute)	8		
Description	(Attribute)	Packet count statistics		
data_rate	(Attribute)	Parameters in this group are single-instance values summarizing the whole file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description

delta_time_end (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time End (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Exclusive elapsed time at the end of each (or the) data segment, referenced to granule_gps_epoch.
delta_time_start (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time Start (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Inclusive elapsed time at the start of each (or the) data segment, referenced to granule_gps_epoch.
qa_n_cal (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of cal packets. (not_set)	counts Derived (QA)	Number of cal packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_header (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of TOF headers. (not_set)	counts Derived (QA)	Number of TOF headers. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_housekeeping (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of Housekeeping packet (not_set)	counts Derived (QA)	Number of Housekeeping packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_sector (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of TOF sectors (not_set)	counts Derived (QA)	Number of TOF sectors. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_shottag (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of TOF shottags (not_set)	counts Derived (QA)	Number of TOF shottags. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_startshot (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of TOF startshots (not_set)	counts Derived (QA)	Number of TOF startshots. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_stopshot (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of Stopshots (not_set)	counts Derived (QA)	Number of TOF stopshots for this channel. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_tof_status (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of TOF_STA packets (not_set)	counts Derived (QA)	Number of TOF_STA packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_unknown (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of Unknown packets (not_set)	counts Derived (QA)	Number of Unknown packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_wedge0 (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of wedge0 packets (not_set)	counts Derived (QA)	Number of wedge0 packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_wedge1 (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of wedge1 packets (not_set)	counts Derived (QA)	Number of wedge1 packets. Statistics are in the order: total, skipped, used, split, duplicate, expected.

Group: /quality_assessment/packet_counts/channel

h5es_id	(Attribute)	57		
Description	(Attribute)	Contains packet counts for each channel present.		
data_rate	(Attribute)	Parameters in this group are single-instance values summarizing the whole file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
qa_n_ranges (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of Ranges (not_set)	counts Derived (QA)	Number of ranges for this channel. Statistics are in the order: total, skipped, used, split, duplicate, expected.
qa_n_stopshot (Chunked Dataset)	INTEGER_4 (6, UNLIMITED)	Number of Stopshots (not_set)	counts Derived (QA)	Number of TOF stopshots for this channel. Statistics are in the order: total, skipped, used, split, duplicate, expected.

Group: /quality_assessment/summary

h5es_id	(Attribute)	9		
Description	(Attribute)	Summary statistics		
data_rate	(Attribute)	Parameters in this group are single-instance values summarizing the whole file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time_end (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time End (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Exclusive elapsed time at the end of each (or the) data segment, referenced to granule_gps_epoch.
delta_time_start (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time Start (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Inclusive elapsed time at the start of each (or the) data segment, referenced to granule_gps_epoch.
qa_s_cell_delay (Chunked Dataset)	DOUBLE (5, UNLIMITED)	Cell delay statistics (not_set)	counts Derived (QA)	Cell delay statistics. Values are in the order number_of_points, minimum, maximum, average, standard_deviation.
qa_s_nshots (Chunked Dataset)	DOUBLE (5, UNLIMITED)	Number of shots/at_segment (not_set)	counts Derived (QA)	Summary statistics for the number of shots in each along-track segment. Values are in the order number_of_points, minimum, maximum, average, standard_deviation.

Group: /quality_assessment/summary/channel

h5es_id	(Attribute)	58		
Description	(Attribute)	Contains summary statistics for this channel.		
data_rate	(Attribute)	Parameters in this group are single-instance values summarizing the whole file.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
qa_s_nranges (Chunked Dataset)	DOUBLE (5, UNLIMITED)	Summary statistics for number of ranges (not_set)	counts Derived (QA)	Summary statistics for the number of ranges per along-track segment for this channel. Values are in the order number_of_points, minimum, maximum, average, standard_deviation.

qa_s_pps (Chunked Dataset)	DOUBLE (5, UNLIMITED)	Summary photon per shot statistics (not_set)	counts Derived (QA)	Statistics for the number of photons per shot in each along-track segment. Values are in the order number_of_points, minimum, maximum, average, standard_deviation.
Group: /range				
h5es_id	(Attribute)	10		
Description	(Attribute)	Photon computed range values		
data_rate	(Attribute)	Parameters in this group are at the photon detection rate.		
Group: /range/channel				
h5es_id	(Attribute)	11		
Description	(Attribute)	Photon ranges per channel		
data_rate	(Attribute)	Parameters in this group are at the photon detection rate.		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
range_uncorr (Chunked Dataset)	FLOAT (UNLIMITED)	Uncorrected Range (not_set)	meters Derived (uncorrected)	Range, uncorrected for oscillator and fiber path length.
shot_num (Chunked Dataset)	INTEGER_4 (UNLIMITED)	shot_number (not_set)	counts Derived	Shot Number, copied from the L1A shottag packet.
Group: /tof				
h5es_id	(Attribute)	12		
Description	(Attribute)	Contains Time-of-Flight packet data for each TOF card in use.		
data_rate	(Attribute)	Parameters in this group are at the rate defined in each tof subgroup.		
Group: /tof/cal				
h5es_id	(Attribute)	13		
Description	(Attribute)	Time-of-Flight CAL data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_cal data rate (nominally once-per-shot where the shot rate is defined by /flight_parameters/laser_rate).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_cal_cell_count (Chunked Dataset)	UINT_2_LE (UNLIMITED)	cell_cnt (not_set)	counts L0 CAL Packet	Cell Count
tof_cal_celldelay_avg (Chunked Dataset)	FLOAT (UNLIMITED)	Cell Delay Avg (not_set)	ns Derived (1/clock_freq)/(cell_cnt+(fcell_cnt/256))	Cell Delay Average in ns
tof_cal_fcell_count (Chunked Dataset)	UINT_1_LE (UNLIMITED)	fcell_cnt (not_set)	counts L0 CAL Packet	Fractional Cell Count
Group: /tof/header				
h5es_id	(Attribute)	14		
Description	(Attribute)	Time-of-Flight Header data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_hdr data rate (every 512 bytes of data in the TOF packet).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_hdr_full_flag (Chunked Dataset)	UINT_1_LE (UNLIMITED)	flag (not_set)	counts L0 HDR Packet	Bit Flag: bit 0=Full Flag went high; bit 1=Half Full Flag Went High flag_values: 1, 2 flag_meanings : full_flag_high half_full_flag_high
tof_hdr_packet_count (Chunked Dataset)	UINT_1_LE (UNLIMITED)	packet_ctr (not_set)	counts L0 HDR Packet	Sector counter
tof_hdr_shot_count (Chunked Dataset)	UINT_4_LE (UNLIMITED)	shot_ctr (not_set)	counts L0 HDR Packet	Shot counter
tof_hdr_user_mark (Chunked Dataset)	UINT_4_LE (UNLIMITED)	user_mark (not_set)	counts L0 HDR Packet	User Marker Flag
tof_hdr_wedge_type (Chunked Dataset)	UINT_1_LE (UNLIMITED)	wtype (not_set)	counts L0 HDR Packet	Wedge Type
Group: /tof/shottag				
h5es_id	(Attribute)	15		
Description	(Attribute)	Time-of-Flight Shottag data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_shottag data rate (nominally once-per-shot where the shot rate is defined by /flight_parameters/laser_rate).		

		/flight_parameters/laser_rate).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
gps_sow (Chunked Dataset)	DOUBLE (UNLIMITED)	GPS seconds of the week (not_set)	seconds L0 Shottag Packet	GPS Seconds of Week
tof_shot_gps_1ms (Chunked Dataset)	UINT_4_LE (UNLIMITED)	GPS 1ms Counter (not_set)	ms L0 Shottag Packet	1ms GPS Counter
tof_shot_gps_200ns (Chunked Dataset)	UINT_2_LE (UNLIMITED)	GPS 200ns Counter (not_set)	ns L0 Shottag Packet	200ns GPS Counter
tof_shot_gps_week (Chunked Dataset)	UINT_2_LE (UNLIMITED)	GPS Week Number (not_set)	weeks L0 Shottag Packet	GPS Week
tof_shot_shot_num (Chunked Dataset)	UINT_4_LE (UNLIMITED)	Shot Number (not_set)	counts L0 Shottag Packet	Shot Number
Group: /tof/startshot				
h5es_id	(Attribute)	16		
Description	(Attribute)	Time-of-Flight startshot data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_shottag data rate (nominally once-per-shot where the shot rate is defined by /flight_parameters/laser_rate).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_start_cell_count (Chunked Dataset)	UINT_1_LE (UNLIMITED)	Cell Count (not_set)	counts L0 Startshot Packet	Cell Count
tof_start_coarse_count (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Coarse Count (not_set)	counts L0 Startshot Packet	Coarse Count
Group: /tof/status				
h5es_id	(Attribute)	17		
Description	(Attribute)	Time-of-Flight Status data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_status data rate (0.1 hz).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
ds_dac_values (Contiguous Dataset)	INTEGER_4 (4)	Array index for dac_values. (not_set)	counts not_set	Array index for dac_values.
ds_osc_parm_reg (Contiguous Dataset)	INTEGER_4 (3)	Dimension scale for osc_param_reg (not_set)	counts not_set	Dimension scale for osc_param_reg
ds_osc_start_reg (Contiguous Dataset)	INTEGER_4 (3)	Dimension scale for osc_start_reg (not_set)	counts not_set	Dimension scale for osc_start_reg
ds_pmt_settings (Contiguous Dataset)	INTEGER_4 (4)	Dimension scale for pmt_settings (not_set)	counts not_set	Dimension scale for pmt_settings
ds_pmt_spi_reg (Contiguous Dataset)	INTEGER_4 (3)	Dimension scale for pmt_spi_reg (not_set)	counts not_set	Dimension scale for pmt_spi_reg
ds_sector (Contiguous Dataset)	INTEGER_4 (6)	Dimension scale for disk sector parameters (not_set)	counts not_set	Dimension scale for disk sector parameters
ds_sfdpsettings (Contiguous Dataset)	INTEGER_4 (8)	Dimension scale for sfdpsettings (not_set)	counts not_set	Dimension scale for sfdpsettings
ds_start_pulse_settings (Contiguous Dataset)	INTEGER_4 (4)	Dimension scale for start_pulse_settings (not_set)	counts not_set	Dimension scale for start_pulse_settings
ds_thres_reg (Contiguous Dataset)	INTEGER_4 (2)	Dimension scale for thres_reg (not_set)	counts not_set	Dimension scale for thres_reg
ds_tof_timing_settings (Contiguous Dataset)	INTEGER_4 (4)	Dimension scale for tof_timing_settings (not_set)	counts not_set	Dimension scale for tof_timing_settings
ds_user_marker (Contiguous Dataset)	INTEGER_4 (3)	Dimension scale for user_marker (not_set)	counts not_set	Dimension scale for user_marker
ds_voltage_monitor (Contiguous Dataset)	INTEGER_4 (16)	Dimension scale for voltage_monitors (not_set)	counts not_set	Dimension scale for voltage_monitors
ds_wedgecounts_value (Contiguous Dataset)	INTEGER_4 (3)	Dimension scale for wedgecounts (not_set)	counts not_set	Dimension scale for wedgecounts
tof_sta_adc_temperature (Chunked Dataset)	UINT_2_LE (UNLIMITED)	ADC_Temperature (not_set)	degreesC L0 TOF Status Data	TBD

tof_sta_card_config_reg (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Card_Config_Reg (not_set)	counts L0 TOF Status Data	TBD
tof_sta_cardoverview (Chunked Dataset)	UINT_1_LE (UNLIMITED)	CardOverview (not_set)	counts L0 TOF Status Data	Register bits: 0=channel (0=low,1=hi); 1=collecting data; 2=ready go in; 3=serial port; 4=temp sens SMB err; 5=SP watchdog err; 6=unused; 7=mem buff ready
tof_sta_currentshotcounter (Chunked Dataset)	INTEGER_4 (UNLIMITED)	CurrentShotCounter (not_set)	counts L0 TOF Status Data	The shot counter of the TOF card. This tells us how many laser shots the card has seen.
tof_sta_dac_values (Chunked Dataset)	UINT_2_LE (4, UNLIMITED)	DAC_Values (not_set)	counts L0 TOF Status Data	(Array of 3) Unused in MABEL.
tof_sta_digital_potent_tol (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Digital_Potent_Tol (not_set)	counts L0 TOF Status Data	TBD
tof_sta_discrete_out_reg (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Discrete_Out_Reg (not_set)	counts L0 TOF Status Data	Unused in MABEL.
tof_sta_fpga_status (Chunked Dataset)	UINT_1_LE (UNLIMITED)	TOF_FPGA_Status (not_set)	counts L0 TOF Status Data	TBD
tof_sta_fpga_version (Chunked Dataset)	UINT_1_LE (UNLIMITED)	FPGA_Version (not_set)	counts L0 TOF Status Data	TBD
tof_sta_gps_sow (Chunked Dataset)	DOUBLE (UNLIMITED)	gps seconds of week (not_set)	seconds L0 TOF Status Data (scaled from ms to s)	The GPS seconds-of-week indicated by the TOF card .
tof_sta_gpsweek (Chunked Dataset)	INTEGER_4 (UNLIMITED)	gps week (not_set)	weeks L0 TOF Status Data	The GPS Week indicated by the TOF card.
tof_sta_hd_capacity_reg (Chunked Dataset)	UINT_2_LE (UNLIMITED)	HD_Capacity_Reg (not_set)	counts L0 TOF Status Data	TBD
tof_sta_hd_current_sector (Chunked Dataset)	UINT_1_LE (6, UNLIMITED)	HD_Current_Sector (not_set)	counts L0 TOF Status Data	(Array of 6) TBD
tof_sta_hd_memory_buff (Chunked Dataset)	UINT_2_LE (UNLIMITED)	HD_Memory_Buff (not_set)	counts L0 TOF Status Data	TBD
tof_sta_hd_start_sector (Chunked Dataset)	UINT_1_LE (6, UNLIMITED)	HD_Current_Sector (not_set)	counts L0 TOF Status Data	(Array of 6) TBD
tof_sta_laser_prf_reg (Chunked Dataset)	UINT_2_LE (UNLIMITED)	Laser_PRF_Reg (not_set)	counts L0 TOF Status Data	TBD
tof_sta_millisecond (Chunked Dataset)	INTEGER_2 (UNLIMITED)	Millisecond (not_set)	ms L0 TOF Status Data	TBD
tof_sta_osc_parm_reg (Chunked Dataset)	UINT_2_LE (3, UNLIMITED)	Osc_Parm_Reg (not_set)	counts L0 TOF Status Data	(Array of 3) TBD
tof_sta_osc_start_reg (Chunked Dataset)	UINT_2_LE (3, UNLIMITED)	Osc_Start_Reg (not_set)	counts L0 TOF Status Data	(Array of 3) TBD
tof_sta_pmt_settings (Chunked Dataset)	UINT_2_LE (4, UNLIMITED)	PMT_Settings (not_set)	counts L0 TOF Status Data	(Array of 4) TBD
tof_sta_pmt_spi_reg (Chunked Dataset)	UINT_2_LE (3, UNLIMITED)	PMT_SPI_Reg (not_set)	counts L0 TOF Status Data	(Array of 3) TBD
tof_sta_ppstag (Chunked Dataset)	INTEGER_8 (UNLIMITED)	PPSTag (not_set)	counts L0 TOF Status Data	Oscillator tick counter
tof_sta_sfdpsettings (Chunked Dataset)	UINT_2_LE (8, UNLIMITED)	sFDPSettings (not_set)	counts L0 TOF Status Data	(Array of 8) Unused in MABEL.
tof_sta_start_pulse_settings (Chunked Dataset)	UINT_2_LE (4, UNLIMITED)	Start_Pulse_Settings (not_set)	counts L0 TOF Status Data	(Array of 4) TBD
tof_sta_tagcountpershot (Chunked Dataset)	INTEGER_2 (UNLIMITED)	TagCountPerShot (not_set)	counts L0 TOF Status Data	TBD
tof_sta_temp_sensor (Chunked Dataset)	UINT_1_LE (UNLIMITED)	Temp_Sensor (not_set)	degreesC L0 TOF Status Data	TBD
tof_sta_thres_reg (Chunked Dataset)	UINT_2_LE (2, UNLIMITED)	Thres_Reg (not_set)	counts L0 TOF Status Data	(Array of 2) TBD
tof_sta_timing_settings (Chunked Dataset)	UINT_2_LE (4, UNLIMITED)	TOF_Timing_Settings (not_set)	counts L0 TOF Status Data	(Array of 4) TBD
tof_sta_tof_chip_temperature (Chunked Dataset)	UINT_2_LE (UNLIMITED)	TOF_Chip_Temperature (not_set)	degreesC L0 TOF Status Data	TBD
tof_sta_user_marker (Chunked Dataset)	UINT_1_LE (3, UNLIMITED)	User_Marker (not_set)	counts L0 TOF Status Data	(Array of 3) TBD
tof_sta_voltage_monitor (Chunked Dataset)	UINT_2_LE (16, UNLIMITED)	Voltage_Monitor (not_set)	volts L0 TOF Status Data	(Array of 16) TBD
tof_sta_wedge_blanking_time (Chunked Dataset)	UINT_1_LE (UNLIMITED)	Wedge_Blanking_Time (not_set)	counts L0 TOF Status Data	TBD
tof_sta_wedgecounts (Chunked Dataset)	INTEGER_4 (3, UNLIMITED)	WedgeCounts (not_set)	counts L0 TOF Status Data	(Array of 3) Unused in MABEL
Group: /tof/stopshot				
h5es_id	(Attribute)	18		
Description	(Attribute)	Time-of-Flight stopshot data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_stopshot data rate (this is the photon detection rate).		
Group: /tof/stopshot/channel				
h5es_id	(Attribute)	19		
Description	(Attribute)	Time-of-Flight stopshot channel data		

data_rate	(Attribute)	Parameters in this group are at the L0 TOF_stopshot data rate (this is the photon detection rate).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_stop_cell_count (Chunked Dataset)	UINT_1_LE (UNLIMITED)	cell_count (not_set)	counts L0 Stopshot Packet	Cell Counts
tof_stop_coarse_count (Chunked Dataset)	UINT_2_LE (UNLIMITED)	coarse_counts (not_set)	counts L0 Stopshot Packet	Coarse Counts
Group: /tof/wedge0				
h5es_id	(Attribute)	20		
Description	(Attribute)	Time-of-Flight Wedge0 packet data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_wedge0 data rate (1 hz).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_w0_gps_1ms (Chunked Dataset)	UINT_4_LE (UNLIMITED)	gps_1ms (not_set)	ms L0 Wedge0 Packet	1ms GPS Counter
tof_w0_gps_200ns (Chunked Dataset)	UINT_2_LE (UNLIMITED)	gps_200ns (not_set)	ns L0 Wedge0 Packet	Wedge 200ns GPS Counter, 0-filled until a GPS time wedge packet is received
tof_w0_gps_sow (Chunked Dataset)	DOUBLE (UNLIMITED)	gps_sow (not_set)	seconds Derived	Wedge GPS Seconds of Week
tof_w0_id (Chunked Dataset)	UINT_1_LE (UNLIMITED)	Wedge ID (not_set)	counts L0 Wedge0 Packet	Wedge ID: 0=No Wedge; 1-3=Wedge 1-3
Group: /tof/wedge1				
h5es_id	(Attribute)	21		
Description	(Attribute)	Time-of-Flight Wedge1 packet data		
data_rate	(Attribute)	Parameters in this group are at the L0 TOF_wedge1 data rate (1 hz).		
Label (Layout)	Datatype (Dimensions)	long_name (standard_name)	units source	description
delta_time (Chunked Dataset)	DOUBLE (UNLIMITED)	Delta Time (not_set)	seconds since granule_gps_epoch Derived (gps_seconds-granule_gps_epoch)	Elapsed seconds since granule_gps_epoch.
tof_w1_elapsed_time (Chunked Dataset)	UINT_2_LE (UNLIMITED)	delta_t (not_set)	seconds L0 Wedge1 Packet	Wedge Time from Last Start
tof_w1_id (Chunked Dataset)	UINT_1_LE (UNLIMITED)	id (not_set)	counts L0 Wedge1 Packet	Wedge ID: 0=No Wedge; 1-3=Wedge 1-3
tof_w1_shot_count (Chunked Dataset)	UINT_4_LE (UNLIMITED)	Wedge 1 Shot Counter (not_set)	counts L0 Wedge1 Packet	Wedge Shot Counter