file sm_ABand_2022_2023.mat

Odin/OSIRIS A-band data November 2022 – May 2023

Version: 2024-05-08 (v3)

The OSIRIS A-band data is stored as an array of structures. The name of the array is sm ("stratosphere/mesosphere"). Each structure contains information from one limb scan as follows:

orb	s	orbit number
scan_number	s	scan number, unique integer identifying the scan, computed as (orbit number * 1000 + scan in orbit)
time	v	time [mjd] at the midpoint of each exposure
observer_position	m	positional vectors (xyz) of the spacecraft at the middle of each exposure
look_vector	m	unit look vectors (xyz) of the OSIRIS line of sight at the middle of each exposure
tangent_altitude	v	tangent altitudes [km] at the middle of each exposure
tangent_latitude	v	latitude [degrees] at the middle of each exposure
tangent_longitude	v	latitude [degrees] at the middle of each exposure
scan_direction	s	direction of scan (1=upp, 0=down)
exposure_time	v	exposure times [s]
time90	s	time when scan passes tangent altitude 90 km
lat90	s	latitude when scan passes tangent altitude 90 km
lon90	s	longitude when scan passes tangent altitude 90 km
Li	v	mean radiance in specific wavelength interval [ph m-2 s-1 str-1 nm-1], i=1-4 referring to integration over MATS filter bands IR1-IR4
dLi	v	measurement error (Poisson statistics) of Li [ph cm-2 s-1 str-1 nm-1]

Variable names in green are variables taken directly from the the Saskatoon Level-1 dataset. Variables in yellow have been added when producing the A-Band data.

Abbreviations:

s: scalar

v: column vector along tangent altitude
(dimension: tangent_altitude)

m: matrix along tangent altitudes with three columns xyz
(dimension: tangent_altitude x 3)

xyz: Earth Centered Earth Fixed (ECEF) coordinates, using the WGS84 geoid.

Upcoming steps:

- Provide data in NetCDF file.
- Provide SZA, SAA and SSA at tangent altitude 90 km instead of 30 km.
- Add original OSIRIS spectra.
- Develop spectral background subtraction to infer pure A-band emissions.