Product definition and data processing requirements

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1. Basic data product

Basic data product of the MDS lidar will the A-scope data and the range corrected A-scope data. The basic data processing and the data format will be as follows.

(Basic data processing)

1) Calculate satellite location of measurement from orbital information, attitude information etc.

2) Zero level correction, sensitivity correction, transmitter power correction.

---> A-scope data

(Example of data format)

Time, Measurement location, Measurement channel, Zero level, Sensitivity correction parameter, etc.

Range from satellite, Altitude (height above sea level), lidar signal

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.....

3) Range square correction

---> Range corrected A-scope data

Graphical indication for the A-scope data and the range corrected A-scope data will be Range Height Indication (RHI).

2. Data Product for Clouds and Aerosols

Studies are required to define data products for specific applications.

The followings are a crude idea on the products and data processing.

(Data Processing for Clouds)

---> Cloud top height and cloud base height

based on gradient detection method

(Graphical indication: RHI)

(Map indication superimposed on meteorological satellite

image)

---> Extinction coefficient with Klett's method
crude (boundary condition at a low altitude) (RHI)
---> Extinction coefficient with Klett's method
detailed (including multiple scattering correction
---> Extinction coefficient with Klett's method
with improved inversion algorithms

(Data Processing for Aerosols and Thin Clouds)
---> Backscatter coefficient
with two component inversion (Fernald's) method.
(boundary condition at an altitude where Mie scattering is small,
Forward inversion) (RHI)
---> Backscatter coefficient
with mproved algorithm

---> Optical thickness of aerosols (Map)
---> Angstrom exponent (Map)

---> Optical thickness of cirrus (Map?)