

火星着陸探査の気象測器 Meteorological Instruments of Mars EDL

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Mars Exploration plan is started for Landing at 2020.

Landing to Mars surface, Moving with Rover, and Searching Life itself.

We, Melos Meteorological Sub Working group, also proposal some instruments.

Those are including Thermometer, Anemometer, Barometer, Radiation Meter, Radiation Thermometer and Navigation camera, LIDAR, Particle counter.

We call first 5 instruments basic instruments set, and last 3 instruments Dust sensors.

This presentation is to introduce developing and testing state of progress of these sensors.

[Thermometer] We use 3 different color thermos-sensors. Difference of radiative absorption makes difference temperature of sensor. Sensible heat is calculated it's difference. And 1 thermo-sensor is heated, for calculating wind velocity.

[Barometer] This instruments is in TRL-5. Using Impedance of Cristal Oscillator is changing with friction of atmosphere.

If we know the air components, the friction is a function of Pressure, so it works as a barometer.

[Radiation Thermometer] Thermocouple seeing to the surface of Mars. It can measure Surface temperature.

[Anemometer] Same as Thermometer. But we use 4 couple of sensor, for calculating wind direction.

[Navigation Camera] This is a BUS-equipment to monitor around the rover. We use this camera to detect dust-devils.

[LIDAR] Counting the back scatter of LASER, We obtain a sum of cross-section of dusts along LASER path. Resolution along path is around 1m.

[Particle Counter] Small In-situ sensor, mechanism is similar to LIDAR.

Counting the scatter of light within very small (0.5x2x1mm) region.

This can measure number of particle for separated to 5 bin of size.

State of developing is very different each other, some is only discussion,

The others are tested with Mars like environment, Mars Environment Simulation Chamber settled in PERC/Chiba Institute of Technology).

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