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Solar Power Supply and Environmental Control System for DIMS Experiment

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The DIMS (Dark matter and Interstellar Meteoroid Study) experiment is designed to study macroscopic dark matters such as nuclearites/strange quark matters (SQM) and interstellar meteoroids. The DIMS experiment system is under construction at the Telescope Array (TA) cosmic-ray experiment site in Utah, USA. The system consists of 4 high-sensitivity CMOS camera stations which will be installed at 3 sites, CLF (Central Laser Facility) and BRM(Black Rock Mesa fluorescence telescope site) of the TA experiment and Hinckley town in the Utah desert each about 20 km apart.
Since electric power is not supplied to the CLF site by the power company, a solar power system is required. Therefore, we have developed a new solar power supply system and conducted observation tests in Japan.
As we are going to operate the camera system every night for an extended period of time, we need to control environmental parameters such as temperature, humidity inside the camera stations as well as monitoring conditions inside and outside the container. We, therefore, developed an environmental control system for the camera station.
In this paper, we will present details of the development and test results of the solar power supply system to be installed in CLF and the environmental monitoring and control system of the camera stations.

Keywords

macroscopic dark matter; nuclearite; strange quark matter; SQM; meteor; meteoroid; interstellar meteoroid; solar power supply; environmental monitor;

Collaboration

other Collaboration

DIMS

Subcategory

Experimental Methods & Instrumentation

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