Solar Thermal Power System for ISRU Applications
Field Deployment and Operation at Mauna Kea, HI

T. Nakamura and B.K. Smith
Physical Sciences Inc.

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background
- Solar power is a readily available fossil fuel source for low cost resource utilization.
- Selecting 600 W of direct solar radiation at the space station power system for lunar-martian proposing of ISRU projects by NASA (U.S.).
- The ISRU Solar System was completed in March 2009 and has been tested at ORBITEC for the carbothermal oxygen production program.

Solar Concentrator Array with Seven Reflector
Solar Concentrator Tested at PSI, March 2004

Solar Concentrator Power Output vs. Reactor Input Optics

Sintered Patch After Thruster Firing

Melting Tephra

Process Optimization
- PSI have deployed and evaluated the solar concentrator array in the field for test setting.
- PSI has a 100 W test station for test setting of solar flux radiometer (100 W) in the field.
- Test station is being used for evaluating the field test settings.

Remote Operation from NASA

Acknowledgments
- We thank the PSI team for their support.
- We also thank NRCAT and ORBITEC personnel who have been very helpful throughout our testing.

Ps Solar Concentrator Integrated with ORBITEC Concentrator Reactor

PSI Solar Concentrator Integrated with ORBITEC Carbothermal Reactor

CT Reactor Melts

PSI Solar Concentrator Integrated with ORBITEC Carbothermal Reactor

Power Output Measurement

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