

ISS Facilities Hardware Catalogue for the Low Temperature Microgravity Physics Facility

I. Facility

1. Facility Full Name: Low Temperature Microgravity Physics Facility
2. Sponsoring Agency: NASA
3. Co-Sponsors/Cooperation Agreements:
4. Builder/Main Contractor: TBD
5. Project Manager: Reuben Ruiz - JPL
6. Project Scientist: Ulf Israelsson

Low Temperature Microgravity Physics Facility

II. Facility Characteristics

1. Facility Type: Externally attached
2. Targeted Research Fields: Fundamental Physics
3. Accommodation: External attach point on the Exposed Facility of the Japanese Experiment Module.
4. Launch Date: 2004
5. Status: Phase A, RDR - 11/99, CDR - 10/00
6. Facility Summary: The LTMPF is a liquid helium dewar with attached electronics that will house two instrument inserts, keeping them cooled below 2.0 Kelvin for six months. The facility permits real-time monitoring of the data and allows transmission of commands for telescience operations. Precision sensors of temperature, pressure and accelerations, modified to function well in the cosmic ray environment of Earth orbit, are supplied as parts of this facility.

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III. Facility Performance Data

- Description: the LTMPF is a liquid helium dewar with attached electronics that will house two instrument inserts, keeping them cooled below 2 Kelvins for six months. The facility permits real-time monitoring of the data and allows transmission of commands for telescience operations. Precision sensors of temperature, pressure, and acceleration, modified to function well in the cosmic ray environment of Earth orbit, are supplied as parts of this facility.
- Temperature range: 1.8 to 2.05 K, internal
- Temperature control: 1 mK to 1 nK, internal
- Sampling rates: < 100 Hz (general); 250 Hz (acceleration)

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IV. Resource Requirements

Physical Specifications:

- weight: 500 kg
- volume: 1.5 m³ (1.85m x 1.0m x 0.8m)
- power: 1 kW
- type of rack/drawer/others: external package attached to JEM-EF

Operations Specifications:

- up/down load: 500 kg up and 450 kg down
- mission scenario: attachment to JEM-EF; 6-month science operation; deintegration of facility from JEM-EF; return to Earth; installation of new instruments; launch-ready within 12 months
- crew time: only for transport of LTMPF between the STS and JEM-EF
- data: temperature, instrument transducers, acceleration
- experiment control: telescience from Investigators' institutions