Dust and Aerosol measurement Feasibility Test (DAFT)

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Objective:

- DAFT is a risk mitigation experiment to evaluate the performance of the TSI P-Trak, a commercially available Condensation Nuclei Counter (CNC), in a microgravity environment.

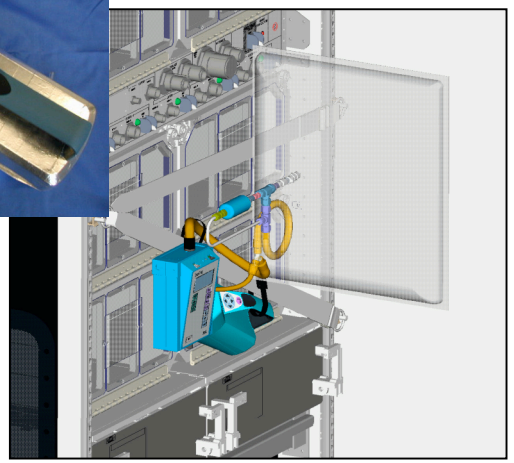
Relevance/Impact:

- DAFT serves as a technology demonstration that mitigates significant technical risk to the success of the Smoke Aerosol Measurement Experiment (SAME). P-Trak is a key diagnostic identified for use with SAME.
- An added benefit is that DAFT provided air quality measurements in the ISS cabin.

Development Approach:

- Due to upmass constraints, DAFT was divided into four separate, functional packages (DAFT-1 through DAFT-4).
- DAFT-1 and DAFT-2 were delivered to the ISS aboard flight 16P in December, 04 and operated during February and March, 05.
- DAFT-3 and -4 were delivered to the ISS in July, 2006 aboard STS-121 and experiment operations were conducted on August 17th and 21st, 2006.
- The accuracy of the measurements could only be assessed using a measurement standard (DustTrak) and known aerosol (Arizona Road Dust) which was flown with DAFT-3 and DAFT-4.

P-Trak, Alcohol Wick (w/Container) and Batteries.



DAFT-3 Configuration, Sample Bag Deflation.

ISS Resource Requirements

Accommodation (carrier)	EXPRESS Rack
Upmass (kg) (w/o packing factor)	7.2 (DAFT-3 and -4)
Volume (m^3) (w/o packing factor)	0.044 (DAFT-3 and -4)
Power (kw) (peak)	0 (Power supplied by PD provided batteries)
Crew Time (hrs) (installation/operations)	15 (Not continuous, Negotiable)
Autonomous Ops (hrs)	0
Launch/Increment	ULF1.1/Increment 13/14

Project Life Cycle Schedule

Milestones	PSR/FHA	Phase III Safety	DAFT-1 & -2 Launch	Ops	DAFT-3 & -4 Launch	Ops	Return	Final Report
Actual/ Baseline	8/03	10/03	12/04	2-3/05	7/06	8/06	12/06	12/07