

## THE MATERIALS ON INTERNATIONAL SPACE STATION EXPERIMENT (MISSE): FIRST RESULTS FROM MSFC INVESTIGATIONS

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### ABSTRACT

Marshall Space Flight Center worked with the Air Force Research Laboratory, Naval Research Laboratory, Langley Research Center, Glenn Research Center, the Jet Propulsion Laboratory, Johnson Space Center, Boeing, Lockheed Martin, TRW, the Aerospace Corporation, Triton Systems, AZ Technology, Alion (formerly ITRI), ENTECH, and L'Garde to bring together the first external materials exposure experiment on International Space Station (*ISS*). MISSE re-uses hardware from the MEEP flown on the Russian space station *Mir*. MISSE has returned a treasure trove of materials data that will be useful not only for *ISS* but also for programs as diverse as the new Crew Exploration Vehicle, the James Webb Telescope, the Lunar Surface Access Module, the Robotic Lunar Exploration Program, High Altitude Airships, and solar sails.

MISSE-1 and -2 (Figure 1) were attached to the Quest airlock on *ISS* for 4 years and were retrieved during STS-114. MISSE-3 and -4 were bumped from STS-114 and are currently slated for deployment during STS-121. MISSE-5 (Figure 2) was deployed during STS-114.

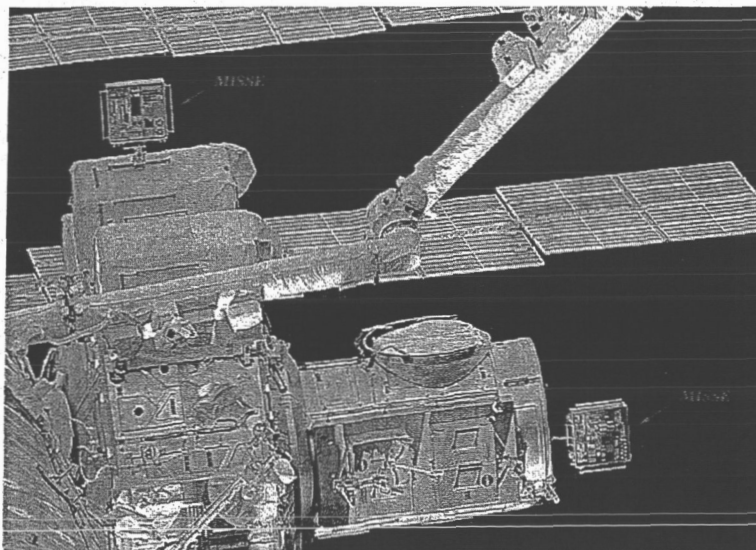


Figure 1. MISSE-1 and -2 deployed on *ISS* from August 2001 to August 2005

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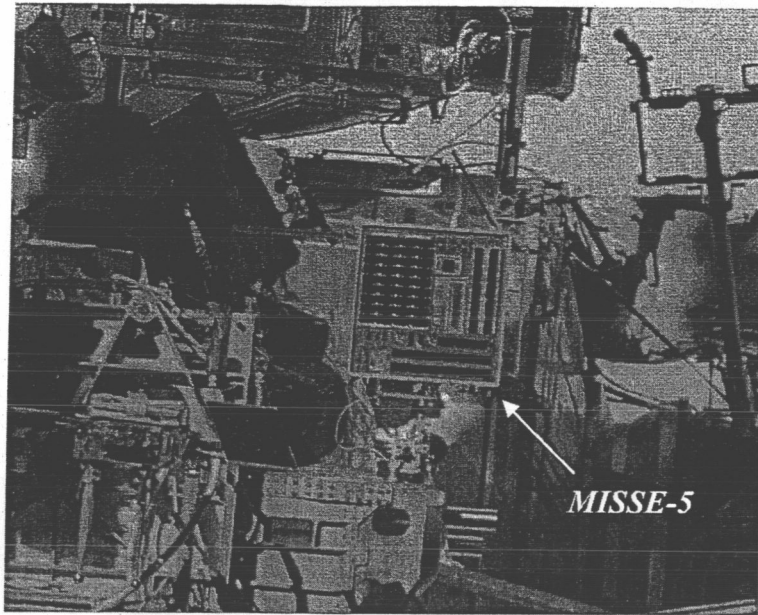


Figure 2. MISSE-5 deployed on *ISS*, August 2005.

Whenever possible, the flight experiment data is compared to ground simulations for data anchoring. Changes in mass, optical properties, and mechanical integrity are discussed.