

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
Facilities and Operations of Microgravity Experiments (5)

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THE SODI DIFFUSION SORLET COEFFICIENT EXPERIMENT ONBOARD ISS: A FLEXIBLE AND  
MODULAR APPROACH TO OPERATIONS IN ORBIT**Abstract**

The Selectable Optical Diagnostics Instrument (SODI) is a Class-2 Payload for scientific experiments in the field of fluids on board the International Space Station. Being equipped with various optical diagnostics, such as Mach-Zehnder Interferometer, Particle Image Velocimetry and Near Field Scattering, this design has been expressly conceived to study several phenomena and, among them, diffusion processes and Soret effects in liquids (SODI DSC). Telespazio (located in Naples, Italy) has played the role of SODI FRC (Facility Responsible Center) and European USOC (User Support Operation Center), receiving the full range of SODI telemetry (HS and Scientific telemetry), issuing commands to the Payload and providing console positions during on orbit active phases (07-Nov- to 16-Jan-2012). The NASA interface to Telespazio Operators has been represented by the Payload Operations Integration Center (POIC) at MSFC (located in Huntsville), that also includes the MSG Ops Team (who was in charge of coordinating all MSG operations, MSG being the class 1 facility hosting the SODI hardware and providing the required interfaces to the ISS data and power systems). In a position of FRC, Telespazio has conceived the mission scenario (Mission Operation Implementation Concept), implemented the Ground Segment and related ground data services, developed all the necessary payload products (flight and ground procedures, displays, payload regulations, ground rules, joint operation interface procedures, payload engineering support concept), and executed the SODI DSC experiment (55 scientific runs) onboard by interacting directly with NASA on behalf of the European Space agency (ESA).