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ANITA (ANALYSING INTERFEROMETER FOR AMBIENT AIR ON THE ISS): TRACE GAS MONITORING WITH ANITA 1 AND PLANS FOR THE NEXT GENERATION, ANITA 2

Abstract

ANITA is a trace gas monitoring system for application in closed habitats such as the ISS. It has been developed as part of ESA technology programs and measures quantitatively quasi on-line more than 30 trace gases (including background gases) in strongly varying matrices. It is an optical system, analyzing the absorption features in the infrared spectrum deriving quantitative compositions of different gas molecules potentially present or even dangerous to the crew on the ISS.

The first system, ANITA 1, has been launched and operated successfully on the ISS as a demonstration facility in 2007 and 2008. ANITA is a joint ESA/NASA project. The instrument itself was developed under ESA contract, with Kayser-Threde GmbH, Munich (now OHB System AG) as prime and instrument developer. SINTEF, Norway, has been responsible for the complex analysis software and system testing of gas analyses, while NASA took care of transport and operations.

Following ANITA 1 return to ground, the mission was critically reviewed and the development of the second generation instrument, ANITA 2, was initiated under ESA contract by OHB System AG and SINTEF. Following a technology program to improve sensibility and reduce instabilities and sensitivity to vibrations, performed until the end of 2015, the development of the second generation ANITA 2 flight instrument for the ISS has been initiated in spring 2016. The system is characterized, in addition to the performance increase, by a drastic reduction in size and mass, such preparing for future applications for exploration.

The paper will highlight the achievements of ANITA 1 with emphasis on running ANITA 2 activities and further shortly address future applications.