

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Space Communications and Navigation Global Technical Session (8-GTS.3)

Author: Dr. Giorgia Parca
Italian Space Agency (ASI), Italy

Dr. Noemi Iacolina
Italy

Dr. Giuseppe Valente
Italy

Dr. Salvatore Viviano
Italy

Dr. Luciano Garramone
Italy

Prof. Enrico Flamini
Italian Space Agency (ASI), Italy

Dr. Enrico Russo
ASI - Italian Space Agency, Italy

DEEP SPACE COMMUNICATION SERVICES PROVIDED BY SARDINIA DEEP SPACE ANTENNA
- SDSA: PROGRAM STATUS AND CAPABILITIES

Abstract

The Sardinia Radio Telescope – SRT is a fully steerable 64 m diameter parabolic radio telescope, capable of operating with high efficiency in the 0.3-116 GHz frequency range, thanks to its active surface. The telescope is located about 35 Km north of the town of Cagliari, on the island of Sardinia and is managed by the Italian National Institute for Astrophysics (INAF) for radio astronomy purposes, and by the Italian Space Agency - ASI for deep space tracking and communication. The infrastructures, the equipment, the operations relevant to the deep space communications and tracking activities performed at SRT site constitute the Sardinia Deep Space Antenna (SDSA), developed by the ongoing SDSA program. The availability of SDSA facility allows ASI to join the worldwide communication network for deep space exploration data delivery and will guarantee a valuable contribution to planetary missions, especially looking at Mars missions after 2020. The SDSA will operate in cross support mode in the NASA Deep Space Network and also in the ESA's tracking station network ESTRACK, in addition to the stand-alone configuration. The SDSA program adopts an incremental approach to develop the full operational capabilities, with the objective to provide deep space communication services at target performances in compliance with the interfaces and the practices currently used in the international deep space network. Once the antenna equipment, the dedicated control center and its operations will be fully set up, the SDSA will contribute in cross support mode to the DSN, from the very beginning, and then to the ESTRACK. In order to be ready for the first demonstration campaign, planned for August 2017, current activities are dedicated to the consolidation of X-Band Receiver capability for Telemetry and Tracking (Doppler, Delta-DOR Delta-differential one-way ranging) services. SDSA Services Verifications Tests are planned and consist of a complete assessment and characterization of the SDSA chain, SDSA internal operations and the SDSA-DSN operations and interfaces. SDSA capability will be first demonstrated for Cassini end of mission in September 2017. Cassini, Maven and MRO Missions are planned to be used for SDSA testing for shadow passes and cross support tests. In this paper, an overview of the program status and development of SDSA capability will be given.