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ROSA GPS RECEIVER ONBOARD OCEANSAT_2 SATELLITE: FEATURES AND OBJECTIVES

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Abstract: OCEANSAT-2 is an Indian space mission which was launched last September 2009. The satellite has onboard a Scatterometer and the Ocean Colour Monitoring instrument. The mission's main objective is just to assure continuity of operational data services of the first satellite while promoting new applications in the area of ocean studies including prediction of cyclone trajectory, fishery and coastal zone mapping.

In October 2005 a Memorandum of Understanding (hereafter MoU) was signed between ASI and the Indian Research Space Organization (ISRO). In said MoU it was decided to put the ROSA GPS receiver (ROSA stands for **R**adio **O**ccultation for **S**ounding the **A**tmosphere) onboard the OCEANSAT-2 satellite. Furthermore, ASI offered the possibility to download OCEANSAT-2 Scatterometer data at ASI's Matera station where a ground facility suitable to serve current and future space missions like ERS and ENVISAT (ESA), ALOS (JAXA Japanese mission), RADARSAT (Canadian) and SAC-D (Argentinean) is going to be realized.

Another item of the agreement was the promotion of a close cooperation between Italy and India for the development of scientific activities and collaborations for the data exploitation of each payload.

Thus in view of the opportunity to fly ROSA on the Indian satellite as well as on other national and/or international space missions (Argentina's Aquarius/SAC-D), ASI's policy plans to cover not only the activities related to the payload but also provide tools for the full exploitation of the data on an operational and scientific basis. In parallel to the activities to accommodate the receiver onboard OCEANSAT-2, a program for developing tools suitable for ROSA data processing was undertaken in which research institutions, as well as small companies are involved. Thus in our contribution an overview of all the activities which will be performed under the ASI umbrella will be given after having described the satellite.

ASI is funding research activities as well. Particular attention is devoted to ionospheric research. the ROSA project includes indeed a wide research line in which the occultation data will be used for Space Weather study and diagnosis. In particular, three lines of search are dealt with. The possibility is explored of realizing a systematic ingestion of this kind of data in stochastic inversion techniques (tomography) producing electron profiles in the absence of spherical symmetry assumption. Furthermore the trace of plasma irregularities on the occultation data is studied via techniques of multi-scale analysis (wavelet). Finally, the relationship between the variability of vertical profile parameters and helio-geophysical proxies is analysed via techniques of information theory.