



Rosa on board the Indian Oceansat-2 mission: scientific activities exploiting Radio Occultation observations

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In the framework of the OCEANSAT-2 mission, the Italian ROSA instrument (Radio Occultation Sounder of the Atmosphere, a new GPS receiver developed by the Italian Space Agency with radio occultation capabilities) will give the opportunity to characterize the lower atmosphere (thanks to the possibility to collect data also using an open-loop tracking scheme) and the ionosphere, opening the possibilities for the development of several scientific activities exploiting these new Radio Occultation data set.

This paper will focus on these activities, which will be carried on by four Italian institution:

- Physics Dept. of Università di ROMA: development of climatic indexes. These activity is based on the utilization of RO data for climatic study. The main work will be focused on tropopause temperature and height determination, large scale water vapour analysis, geopotential field retrieving for dynamic indexes, evaluation and comparison of RO data with LIDAR profiles in stratosphere.

- Physics Dept. of Università di CAMERINO: assimilation of Radio occultation data into Numerical Weather Prediction models both for real time prediction and for climatological studies. This section includes: sensitivity study on different vertical and

horizontal resolution; evaluation of possible modification of forecasts by Numerical Weather Prediction Models; comparison between different vertical coordinates for assimilating RO data; study of observed and modelled gravity waves.

- CNR - Istituto di Fisica Applicata “Carrara” / Istituto dei Sistemi Complessi di FIRENZE: use of Radio Occultation data for ionospheric studies and space weather applications. Three aspects will be focused. The first one deals with the identification of new techniques which allow ionospheric compensation in the propagation delay of a single frequency signal. The second consists of monitoring the plasmaspheric total electron content as a space weather tool. The third deals with a statistical study of ionospheric scintillations introduced in the LEO-GPS links, in order to detect and model the influences of some solar/geophysical parameter on radio communications and space weather monitoring.

- Politecnico di TORINO: in the framework of the forthcoming ROSA mountain test campaign for the validation of the open-loop capabilities of the receiver, it will be carried on an activity for the identification of atmospheric induced and reflection induced patterns on the received signal. The development and the validation of an inversion scheme for ground based GPS occultation measurements is also planned.

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