



## THE Flying Italian GPS Radio Occultation Experiment ROSA on Board OCEANSAT-2 Mission

Francesco Vespe (1), Giovanni Perona (2), and the ROSA Team

(1) Agenzia Spaziale Italiana, Centro di Geodesia Spaziale, Matera, Italy (francesco.vespe@asi.it, +39 0835 339005), (2) Istituto Superiore M. Boella, Torino, Italy (perona@polito.it)

The GPS Radio Occultation (RO) is an emerging remote sensing technique for the profiling of atmospheric parameters (first of all refractivity, but also pressure, temperature, humidity and electron density). It is based on the inversion of L1 and L2 GPS signals collected on-board a Low Earth Orbit (LEO) platform, when the transmitter rises or sets beyond the Earth's limb. The relative movement of both satellites allows a "quasi" vertical atmospheric scan and the profiles extracted using this technique are characterized by a high vertical resolution (limited by Fresnel diffraction, thus varying between 500 m near the surface up to 1500 m in the higher stratosphere and ionosphere) and a high accuracy (for example < 0.5% in terms of refractivity fractional error up to 30 km height). The RO technique is operatively applied for meteorological purposes (data collected by one LEO receiver placed at 700 km altitude produce 500-600 profiles per day well distributed around the globe) since such observations can easily be assimilated into Numerical Weather Prediction models. Anyway it is very useful also for climatological purposes (the accuracy of inferred Tropopause parameters is one of the most attractive aspect of the RO technique), for gravity wave observations and for Space Weather applications.

Actually, some operative satellite missions are carrying on-board GPS receivers for RO purposes. Between them, the German CHAMP satellite, the European METOP-1 mission and the USA/Taiwan COSMIC constellation are the most representative. On last September during the 2009 the Indian OCEANSAT-2 mission carrying on-board the Italian ROSA (Radio Occultation Sounder of the Atmosphere) was launched. Thus our contribution will focus on the description of the ROSA receiver and its implementation on-board the Indian OCEANSAT-2 Satellite Mission. Moreover, details about the operative Ground Segment for the processing of ROSA observations and about the data dissemination are also given. Finally some results achieved during the present commissioning phase will be showed and discussed.