Implementation of ROSA radio occultation data handling into EUMETSAT and GRAS SAF processing

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Within this contribution, outcomes from a GRAS – SAF Visiting Scientist activity focused on the analysis of ROSA data quality for their use in operational weather forecasting will be described and main results will be shown. The ROSA Radio Occultation instrument has been developed by Thales-Alenia-Space, Italy and was funded by the Italian Space Agency (ASI). Such instrument is actually flying on-board three opportunity missions: the Indian OCEANSAT-2, the Argentinean SAC-D and the Indian-French MEGA-TROPIQUES. Focus of this Visiting Scientist activity has primarily been the analysis of ROSA data from OCEANSAT-2.This activity was divided into two parts. In the first one, performed at EUMETSAT, ROSA data processing was implemented into the EUMETSAT YAROS processor. The required updates into such processing package were implemented in order to make it able to properly manage also ROSA raw observations. It has to be noted that this processor is the baseline for the operational next generation EUMETSAT Radio Occultation ground segment: any changes performed in the framework of YAROS can easily be transferred to the operational ground segment. The YAROS – EUMETSAT processor was then updated and adapted to work with the ROSA raw data, tracking frequencies and instrument database. Adaptation to open loop data, navigation bits acquisition and potentially ionospheric measurement will be performed in the next future. NetCDF-4 YAROS output files are phases, amplitudes, bending angles over impact parameter, along with all other required data. Robust bias and standard deviation of bending angles to ECMWF collocated data were the statistical indicators generated to evaluate the quality of the ROSA observations. The second part of the activity was the adaptation of the GRAS-SAF ROPP (Radio Occultation Processing Package) processor for ROSA data processing. This second part was performed at Danish Meteorological Institute and has been focused on bending angles, refractivity and higher level product generation and validation against ECMWF and co-located occultation profiles. For the first time, one month of ROSA data have been deeply analyzed by a state-of-the-art Radio Occultation processing software and results will be described in the framework of this contribution.