PAU ONE-RECEIVER AIRBORNE INSTRUMENT: INITIAL RESULTS

E. Valencia , X. Bosch-Lluis, A. Camps, A. Aguasca, N. Rodríguez-Álvarez, I. Ramos-Perez, J.F. Marchan-Hernandez, M. Glenat and F.Bou
Remote Sensing Lab, Dept. Teoria del Senyal i Comunicacions, D3, Universitat Politècnica de Catalunya.
Tel. +34+934017362, E-08034 Barcelona, Spain.
E-mail: valencia@tsc.upc.edu

The description of PAU, a new hybrid, L-band radiometer, GNSS reflectometer and IR radiometer, is given in [1]. An airborne one-receiver demonstrator has being implemented (PAU-ORA) which will not include the IR radiometer. PAU-ORA is a compact version and lighter to be flown onboard a 2.6 meter wingspan and 5 kilogram payload carry power unmanned aircraft, with approximately 45 minutes flight autonomy [2].

Due to mass, space and power restrictions of the unmanned aircraft, PAU-ORA has been split in two parts: the onboard elements, where analog IF data is obtained and downlinked, and the ground-based, where the data is processed. The main onboard elements are an aerodynamical 7 element hexagonal L-band left hand circularly polarized antenna array, a single temperature-controlled thermally isolated box that houses the receiver, and a downlink system to send the raw data and the aircraft position and attitude. The ground-based segment is composed of a raw data receiver system to bridge the data to the process unit, composed by two FPGA's: The first one performs the radiometer processing whereas the second one performs the GNSS reflectometer tasks. A central computer where results are stored and/or further processed.

The first PAU-ORA measurements comprise flights both over the sea near the shoreline (fresh and sea water) and over land at Delta de l'Ebre, Spain.

This paper will discuss the PAU-ORA performance and will present and analyze the first measurements acquired with it.

References:

[1] A. Camps, X. Bosch-Lluis, I. Ramos-Perez, J. F. Marchan-Hernandez, B. Izquierdo and N. Rodríguez, "New Instrument Concepts for Ocean Sensing: Analysis of the PAU-Radiometer", *IEEE Transactions on Geosceince and Remote Sensing*, vol. 45, no 10, pp. 3180 – 3192, Oct. 2007.

[2] A. Camps, A. Aguasca, X. Bosch-Lluis, J. F. Marchan-Hernandez, I. Ramos-Perez, N. Rodríguez-Álvarez, F. Bou, C. Ibáñez, X. Banqué and R.Prehn, "Measurements and First Results of the One-Receiver PAU Instruments", Proceedings of the International Geoscience and Remote Sensing Symposium, IGARSS07, July 23-27, 2007, Barcelona, Spain.