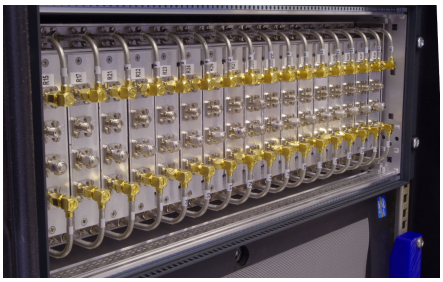
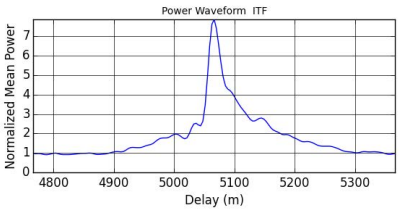
Activity Title:	***Software PARIS Interferometric Receiver (SPIR) - Airborne Flight Experiment***		
Contract type	**TRP**	**Budget** *(k€)*	**190**
Company (-ies) *(including country)*	Institute of Space Studies (IEEC-CSIC), Spain Aalto University of Helsinki, Finland		
Team *(name of the participants in the project)*	Serni Ribó, IEEC Antonio Rius, IEEC Fran Fabra, IEEC Erkka Rouhe, AALTO Jaakko Seppanen, AALTO		
(*) **Speaker (s)**	Serni Ribó	**Email**	ribo@ice.cat
Short Speaker Information *(experience and involvement in this project – maximum 60 words)*	He has worked on the development of several remote sensing instruments at the microwave band. In particular, in the areas of synthetic aperture interferometric radiometry for the measurement of soil moisture and ocean salinity from airborne (AMIRAS) and spaceborne platforms (SMOS), and in the area of GNSS reflection instruments for sea-surface altimetry (PARIS-IOD) and roughness observations.		
Summary of the activity *(maximum 400 words and 2 pictures)*	The aim of this project is to demonstrate the synoptic capabilities of GNSS-reflectometry from an airborne platform. That is, to gather simultaneous reflection points of GNSS signals on the sea surface with the aim of obtaining "wide swath" altimetric measurements. The final objective of such observation would be to allow the densification in space and time of future spaceborne sea-surface altimetry measurements to improve mesoscale ocean altimtery measurements. The remote sensing technique on which this project is focussed is the so-called PARIS interferometric technique. This technique consists of the computation of the cross-correlation between the GNSS signal received through the line of sight path and the signal which has been reflected by the sea-surface. The resulting cross-correlation waveform is used to obtain delay estimates of the time of arrival of the reflected signal, and from this to obtain an altimetric estimation. Prior to this cross-correlation, the direct and reflected signals need to be alined in the delay and Doppler domains (as they travelled through different paths). In addition, in order to obtain synoptic observations, the signals are gathered with two antennas arrays (up & down) and digital beam-forming is used to point to each of the pairs of direct and reflected signals for each transmitting GNSS satellite. In this project a high-speed data recorder has been developped, capable of gathering GNSS signals of two antenna arrays of eight elements each, down-convert the signals to IF band, sample and quantize the signals at high speed and record the signals at a rate of 320 MB/s = 2.56 Gbps during more than 3 hours. Also a software signal processor (digital-beam former, correlator, delay estimation algorithms) has been developed to post-process the signal. The receiver was tested in an airborne campaign at the Baltic Sea aimed at demonstrating the synoptic capabilities of GNSS reflectometry. The recorder, the software processor and the obtained scientific results will be presented. The technology on which the recorder is based could be applied to other areas where high speed data-acquisition is needed.  		

(*) The speaker needs to do the registration through this website