



University of Pavia

Ph.D. Program of Electrical and Electronics Engineering and Computer Science

SEMINAR

WIRELESS SENSING IN SPACE APPLICATIONS

Ing. Pier Giorgio Arpesi
Selex ES, Nerviano (MI)

December 4th, 2015, h 14.00 – 16.00, room E6

Abstract: Wireless sensing can be an important driver for enabling technology improvement of the near future space platforms and vehicles.

Remote measurements of physical parameters can be collected by a wireless sensor network (WSN) for the ground testing campaign of aerospace platforms, with the future perspective of extension to on-board flight applications. Thinking about both ground and in-flight operations, the wireless monitoring system must work in a very hostile environment. The presence of metal cavities and obstacles makes the radio frequency (RF) propagation harder due to the multipath fading propagation channel, causing both line-of-sight (LOS) and non-line-of-sight (NLOS) radio communication conditions. Further, space conditions include operation under high vacuum and extreme temperature ranges with associated thermal stress, and in presence of high levels of ionizing radiations.

This seminar will focus on the use of wireless (RF) technologies for temperature sensing and monitoring on board spacecrafts and generally in the frame of space-related applications. The results of current investigations will be presented with particular regard to the passive sensors technology utilization within the space environment constraints, which are mainly represented by the Electromagnetic Compatibility (EMC) aspects and the peculiar propagation conditions.

Bio: Pier Giorgio Arpesi received his Laurea degree in electronic engineering from the University of Pavia (Italy) in 1990 and then he joined the “Space Department” of Siemens Telecomunicazioni S.p.A., Milan, Italy, as a microwave engineer being involved in the design and development of ultra-low noise amplifiers at L-band and S-band for on board receivers.

In 1996 he moved to Laben S.p.A. of Alenia Aerospazio group in Milan, Italy, where he was responsible for the design of low noise EHF receivers (44 GHz frequency) in the frame of SICRAL program, the Italian military satellite. He was also involved in the preliminary study of space radiometers up to 100 GHz for Planck satellite mission.

In 2000, he joined Siemens I.C.N., Milan, Italy, being in charge of the development of Ku-band synthesizers in the frame of a 60 GHz low capacity radio link for micro-cell applications.

Since 2001 he has been with Selex ES, Milan, Italy, working as a project leader on several space programs related to frequency synthesizer units and solid state power amplifiers in the HF, VHF and UHF frequency bands. He is currently the Head of the Time and Frequency Group within the space engineering section.

Organizer

Prof. P. Savazzi

Seminar in English

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Ph.D. Coordinator

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