

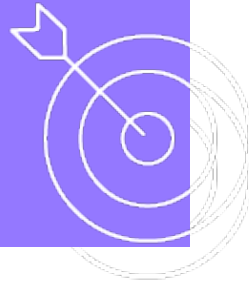
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PHOtonic Experimental Bench for the fuTure Satcom



Objectives

- Introduce Microwave Photonic Technologies (MWP) in the payload test facilities in order to improve industrial process
- Test a new generation of on-board MWP units with realistic signals of telecommunication missions.



Context

- 2020 VHTS satellites host 10x more RF ports than previous generation. This complexity is hard to manage especially during payload testing in vacuum chamber
- Optical fiber can advantageously replace coaxial cable harness. The challenge is to distribute RF reference signals with a metrological quality.
- MWP is key in new generation of payloads thanks to its lightness and its robustness to EMC. However the testing methodology need to be revised to validate performance of embedded functions based on this technology



1,4 M€



42 months

Jan.18 – May 21



TAS

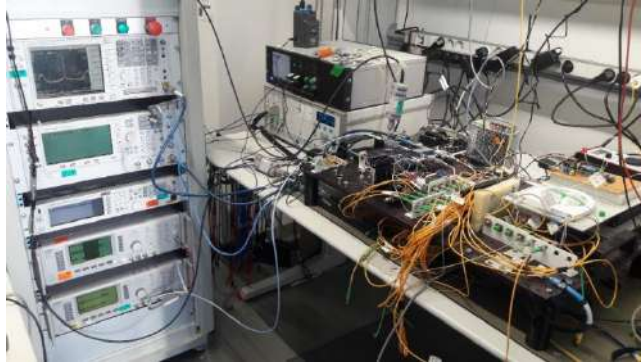
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Key results



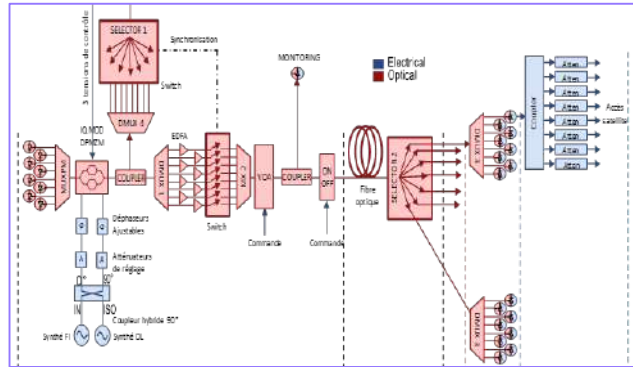
Innovative architecture

2 different photonic architectures have been evaluated and tested enabling operation with multiple RF band (Ku, Ka, Q/V) with high reliability (few active components in vacuum chamber)

Payload test bench

A proof of concept demonstrator is being developed and will be transferred to TAS for validation with a real payload

Thanks to a collaboration with Fraunhofer HHI, a reliability program has been set up on a critical component not submitted to ITAR regulation



Testing methodology

The performance degradation of embedded MWP based functions has been evaluated with digital signals which is simpler than in analog domain