27th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Small Earth Observation Missions (4)

Author: Mr. Jose Pedro Ferreira
Tekever, Portugal

Mr. Nuno Andrada
Tekever, Portugal
Mr. Bruno Correia
Tekever, Portugal
Mr. Tiago Pinto
Tekever, Portugal
Mr. Rui Santos
Tekever, Portugal
Mr. Vitor Cristina
Tekever, Portugal
Prof. Sergio Cunha
University of Porto, Faculty of Engineering, Portugal

CHALLENGES OF THE SAR-ENABLED MICROSATELLITE CONCEPT INFANTE

Abstract

The development of breakthrough technologies and the opening of space sector to non-governmental entities over the last decade had enabled the reduction of development and launch costs, thus diminishing the complexity of accessing space. These factors, aligned with the highly differentiated benefits associated with the space market, allow for a new approach regarding not only risk and investment profiles, but also product design.

The INFANTE project arises from the emergence of business opportunities in the space sector, exploiting the highly experienced entities that had been developing critical subsystems for space missions over the last 20 years. Building on such know-how, the project led by TEKEVER puts together internationally established Portuguese companies and R&D institutes towards a common goal: developing and demonstrate a microsatellite for Earth Observation (EO) with innovative solutions. As a precursor for future constellations, INFANTE will be able to enhance the national situational awareness on forest fires, agricultural management, maritime surveillance, and extreme meteorological events monitoring.

To do so, INFANTE will deploy an innovative suite of both optical and radar sensors, exploring different imaging possibilities across several bandwidths using satellite-borne cameras and a Synthetic Aperture Radar (SAR). Furthermore, SDR-based sensors onboard will allow fusing geo-positioning data with Earth imagery so that a more cohesive and valuable data package can be provided. Such can be used to improve the current EO models or to pave the way for new solutions of vertical integration of EO data to monitor the planet.

In tandem, INFANTE also showcases an adaptive payload bay, with dedicated control electronics, capable of hosting different experimental payloads provided by multiple stakeholders. These payloads aim at in-orbit technology demonstration and gathering of scientific data, which will allow increasing its Technology Readiness Level (TRL).

This paper presents the challenges faced in the development of the INFANTE platform and corresponding payloads. Parallelly, the project-level approach to manage such a large consortium is explored,

along with alternative methodologies of handling the Assembly, Integration and Test (AIT) phase within the *New Space* framework.