

Statement and Objectives

Mission Statement

The ^{Po}Cat-Lektron is a mission resulting from the *IEEE OpenPocketQube Kit* initiative, developed at the UPC NanoSat Lab. The mission has been selected in the 4th call of the ESA Fly Your Satellite! (FYS) program. The mission analysis presented corresponds to the ^{Po}Cat-Lektron mission. It consists of two 1P PocketQubes, the ^{Po}Cat-2 and the ^{Po}Cat-3, developed as a part of the *IEEE OpenPocketQube Kit*. This mission aims to demonstrate the feasibility of PocketQube platforms for remote sensing applications. The payloads on board of the PocketQubes are two passive radiometers to be used for RFI purposes on K and L bands. Apart from the remote sensing nature of the mission, this mission also aims to demonstrate the feasibility of the PocketQube platforms to create, manage and join Federated Satellite Systems. To do so, the FSS Experiment will be reproduced as a part of the experiments of the mission.

Mission Objectives

- 1. Demonstration of Scientific Viability:** Demonstrate the feasibility of conducting scientific missions using PocketQube platforms. To do so, the mission proposes collecting valuable RFI data through a K-Band and L-Band passive radiometers (One for each PocketQube). The payloads will monitor interferences on these bands. This data will facilitate enhanced detection and the generation of heatmaps indicating RFI distribution across the globe. In this experiment we aim to obtain data on the K-Band to see the impact on the atmospheric water vapor measurements, and in the L-Band the interferences over the Position Navigation and Timing (PNT) signals.
- 2. Satellite Federation Concept:** To establish and demonstrate that PocketQube platforms can create, manage and join Federated Satellite System (FSS). This proof of concept for this resource-limited platforms is based on the reproduction of the FSS Experiment conducted at the UPC NanoSat Lab. The demonstration consists on creating a federation between 2 PocketQubes, in order to download data. Previous missions such as the FSS-Cat from the UPC NanoSat Lab demonstrated the feasibility of this opportunistic collaboration using 6U CubSats.
- 3. Educational Development:** As a mission developed at the UPC NanoSat Lab, the mission is oriented for undergraduated students to gain experience and get involved in real space missions. In addition, several Bachelor and Master Thesis had been done from this project, apart from the academic papers that this project has produced.

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