Comunidad de Madrid

Dirección General de Investigación e Innovación Tecnológica

CONSEJERÍA DE EDUCACIÓN, CIENCIA Y UNIVERSIDADES

UNIÓN EUROPEA

Fondos Estructurales

Invertimos en su futuro

PROGRAMAS DE I+D EN TECNOLOGÍAS 2018

ACRONIMO: **MARTINLARA**

TITULO PROGRAMA: **Millimeter wave Array at Room Temperature for INstruments in LEO Altitude Radio Astronomy**

PRESUPUESTO CONCEDIDO: **887.856 €**

Madrid, 17 y 18 de abril de 2024

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MARTINLARA - ¿Quiénes participamos?

uc3m | Universidad Carlos III de Madrid

MILLIMETER AND SUBMILLIMETER TEAM

EP²

G.O.T.C.

POLITÉCNICA

idr

UNIVERSIDAD COMPLUTENSE MADRID

AEGORA
COMPLUTENSE
RESEARCH GROUP ON SPACE ASTRONOMY AND DATA MINING

GOBIERNO DE ESPAÑA
MINISTERIO DE DEFENSA

INTA

GOBIERNO DE ESPAÑA
MINISTERIO DE TRANSPORTES Y MOVILIDAD SOSTENIBLE

Instituto Geográfico Nacional 1870 · 2020

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MARTINLARA - ¿Qué objetivos planteamos?

Design of a demonstration space mission in orbit

MARTINLARA

- **Technological demonstration of a multiband array of 3 ground and 3 sky mm-wave photonic radiometers working at room temperature.**
- **Observe interplanetary dust interaction with Earth and the magnetic South (North) poles with the ground mm-wave photonic radiometers.**
- **Observe the Earth ground temperature with the ground mm-wave photonic radiometers.**
- **Observe the cosmic microwave background (CMB) with the sky mm-wave photonic radiometers.**
- **Technological demonstration of the first Spanish electrical micro pulsed plasma thruster (µPPT).**
- **Demonstrate a versatile nanosatellite platform for the demonstration of space technologies.**

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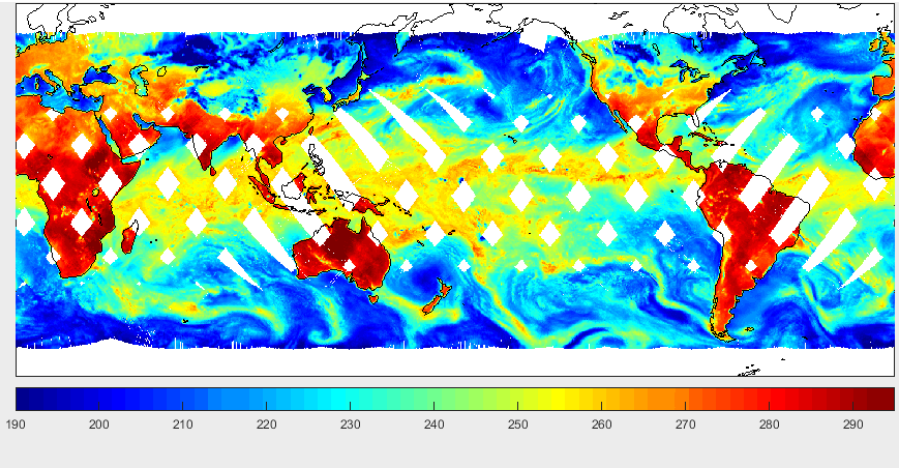
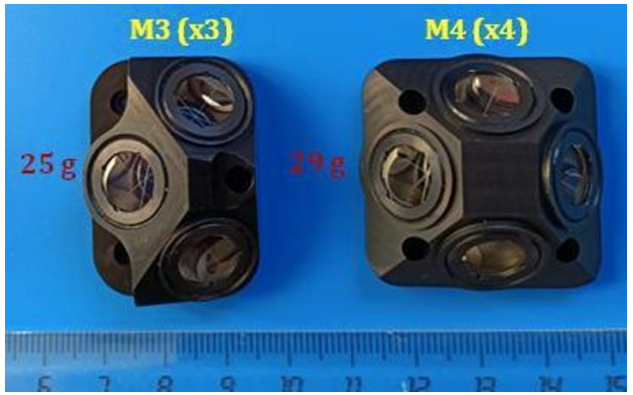
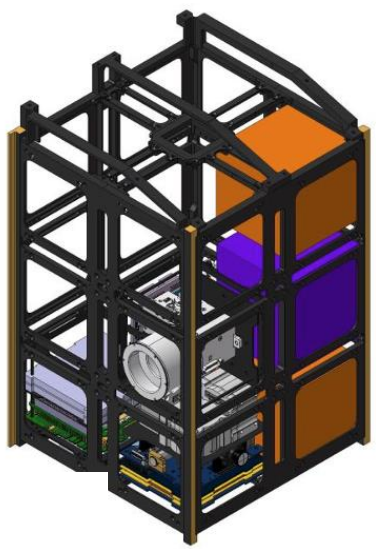
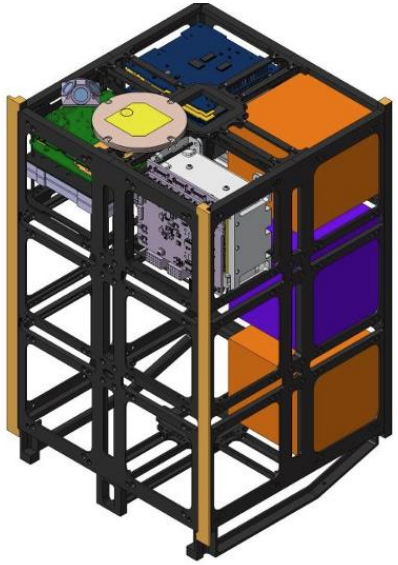
MARTINLARA - ¿Qué resultados hemos obtenido?





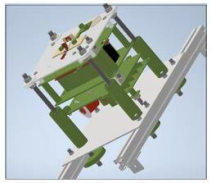


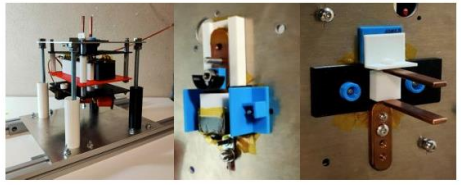


Objetivo 4: Micro Pulsed Plasma Thruster

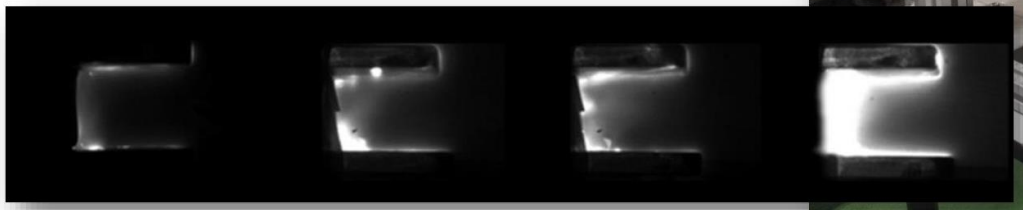
Some pictures.

*Breadboard model **1** (Previous design approaches were not built)*

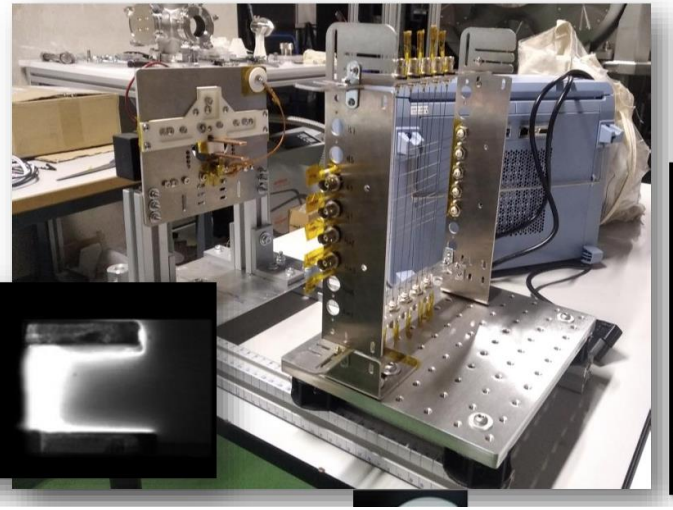


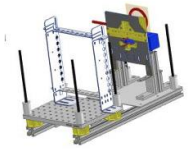


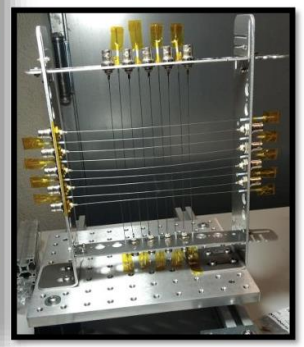
APPT discharge sequence (camera).



*Breadboard model **3b** and the innovative probe-gid diagnostics system to investigate the transient plume shape*

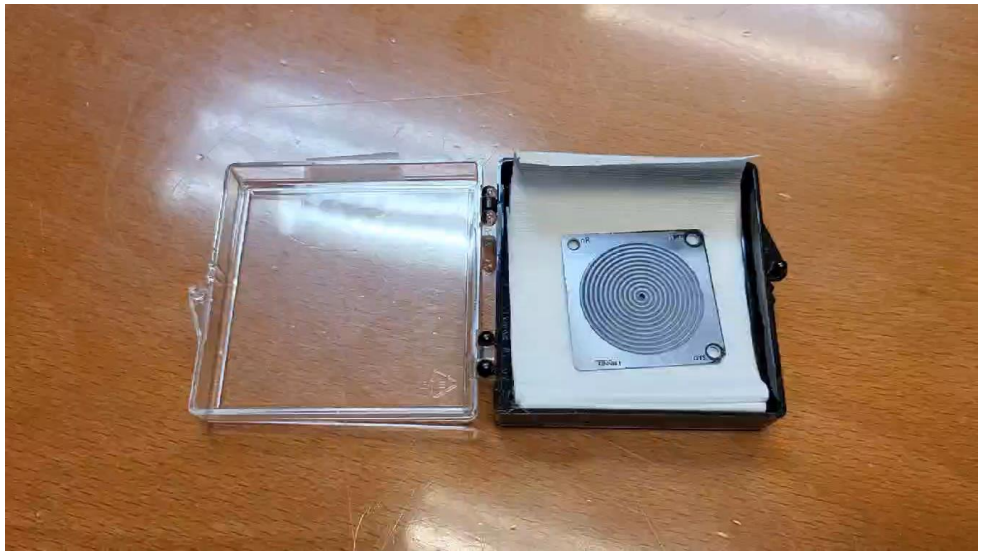


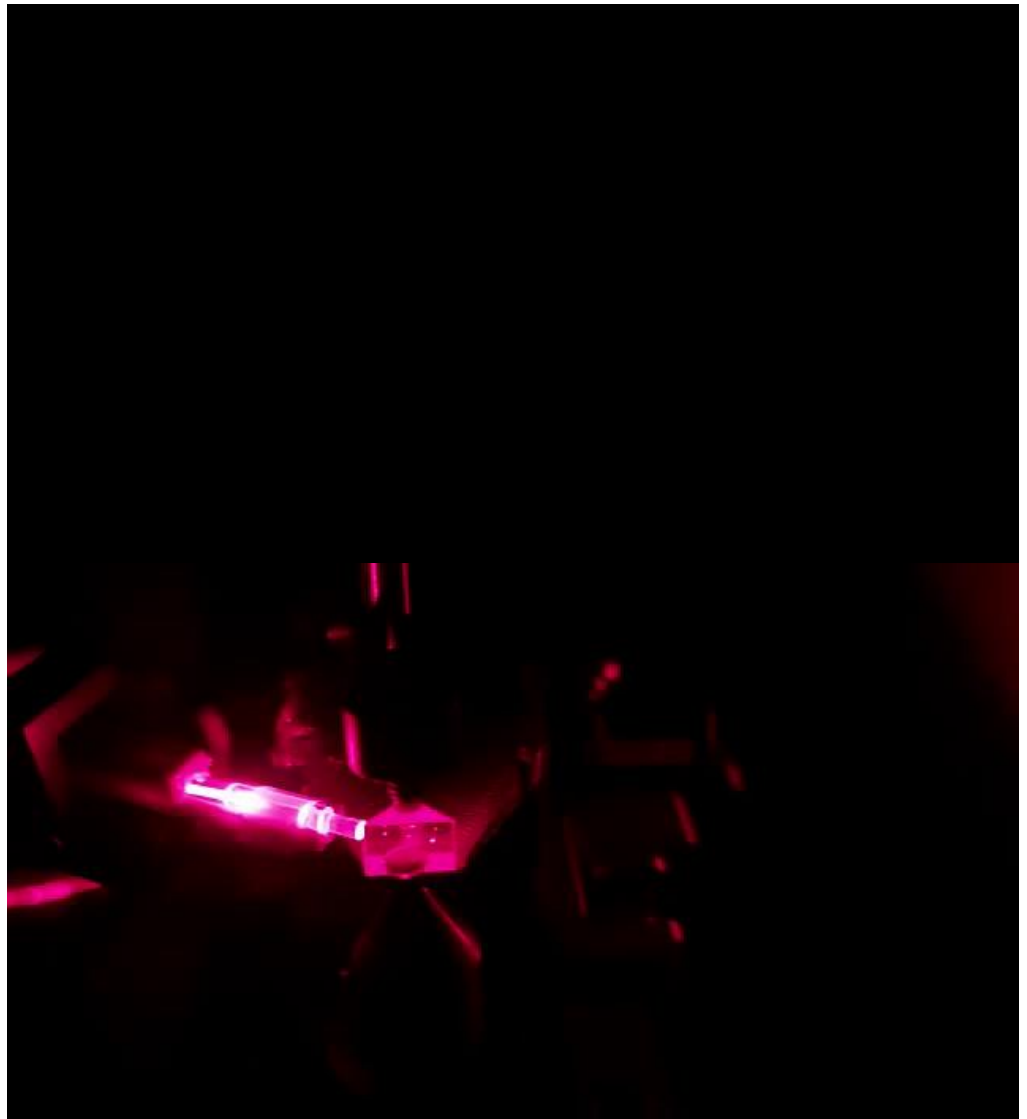




MARTINLARA Preliminary
Internal 12U Configuration

MARTINLARA - ¿Qué resultados hemos obtenido?





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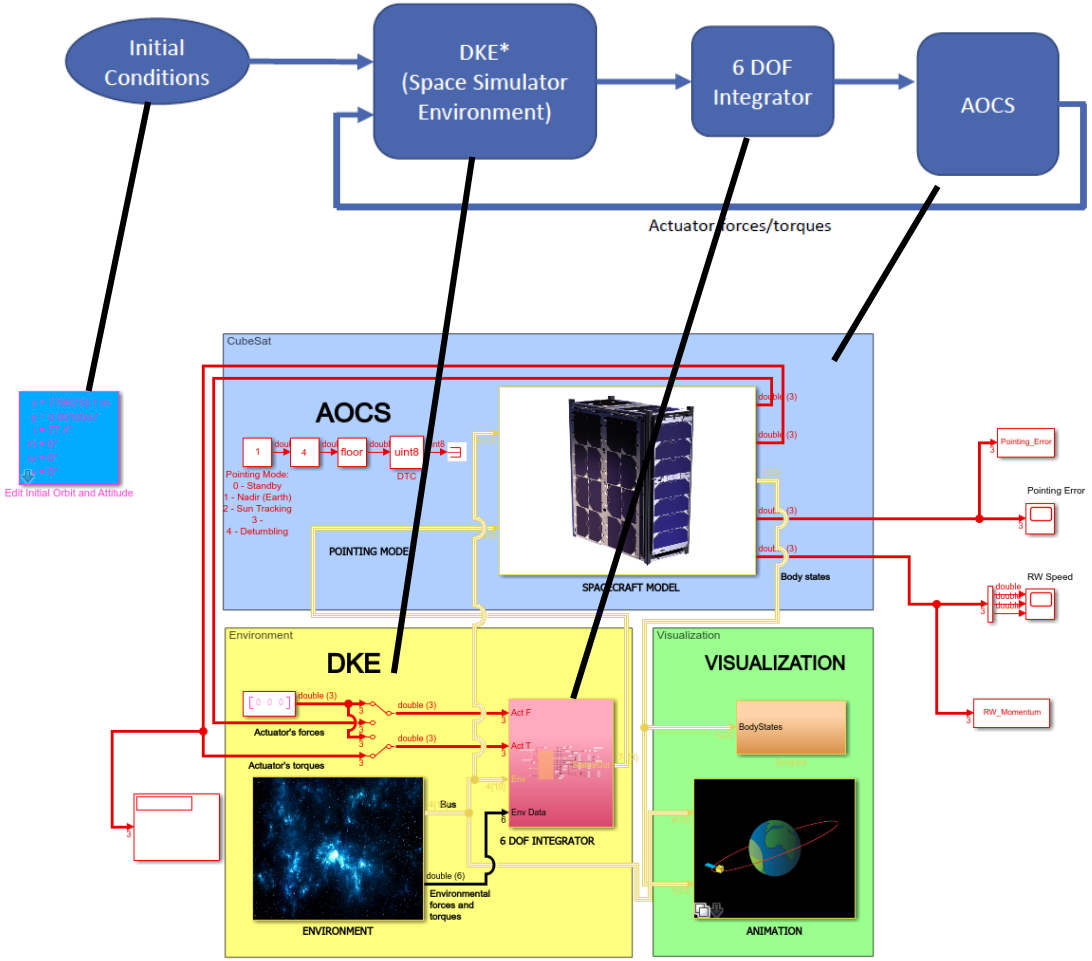
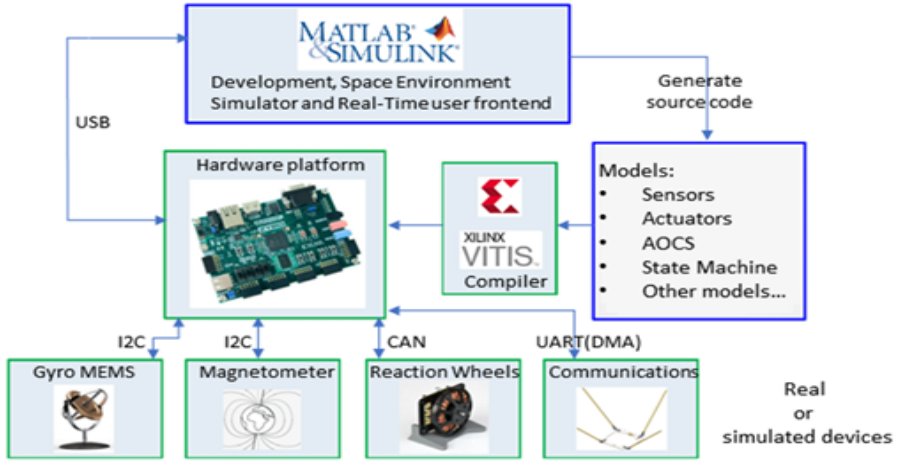
MARTINLARA - ¿Qué resultados hemos obtenido?

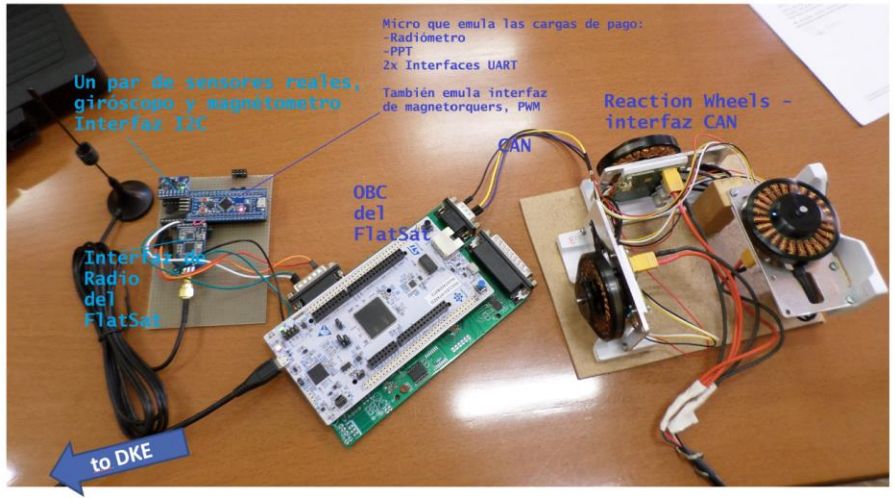
Desarrollo de un simulador DKE



Implementación PIL/MIL



Martin-Lara FlatSat



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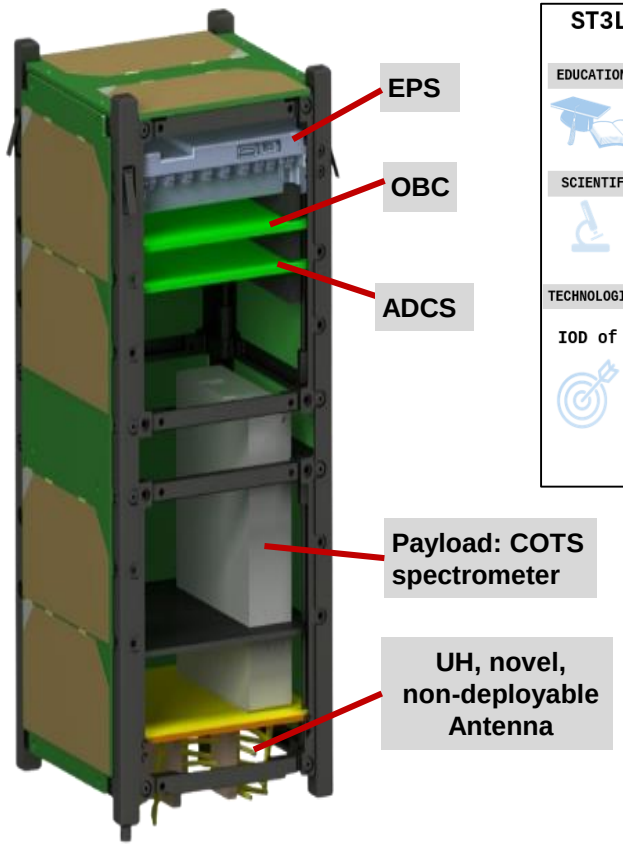
MARTINLARA – ¿Cómo hemos continuado?

ST3LLARsat1 BOIRA: The 1st student CubeSat program at UC3M

Started: Sept'22 --> launch 2025/2026

ESA FYS-DB: Dec'22 --> May'24 (FDR)



ST3LLARsat1 BOIRA: Project Goals

EDUCATIONAL

1st UC3M CubeSat student programme

To provide students with **hands-on experience in a real space project**

SCIENTIFIC

Aim is to **design, build, launch and operate a 2U CubeSat**

to monitor climate change by measuring local atmospheric moisture

TECHNOLOGICAL

IOD of

1. **All the operating equipment** (except payload) fitting in about **1U**
2. **A weather-observing scientific instrument** fitting in about **1U**
3. An in-house **state-of-art compact communication antenna**
4. An in-house OBC software for **advanced AOCS/ADCS algorithms**

UPMSAT-3 Interactive 3D Model | US3-E-ML-100000-02F 02 April 2024 | 1

UPMSat-3 Interactive 3D model