

Uvsq-Sat NG, un satellite dédié à l'observation des gaz à effet de serre

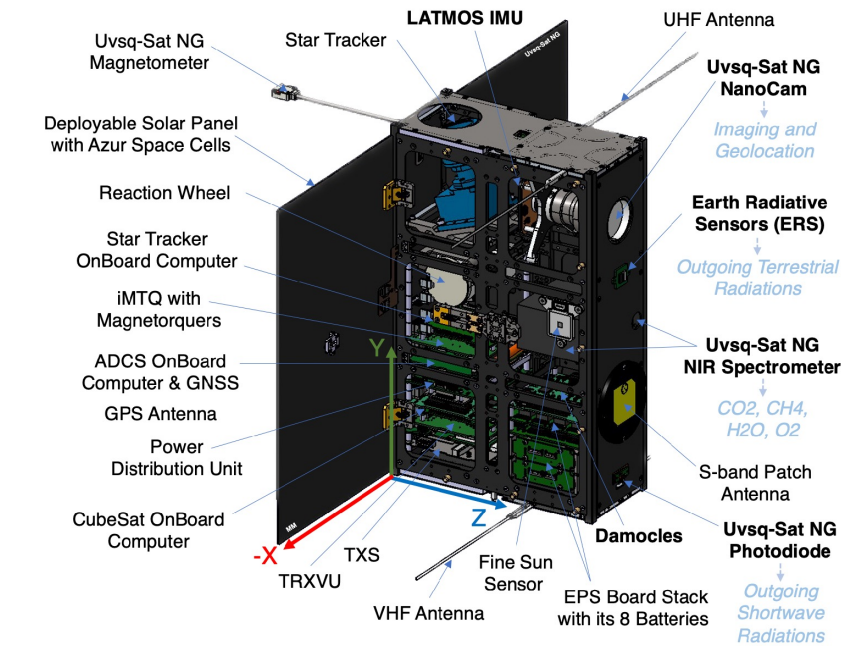


Uvsq-Sat NG

Uvsq-Sat NG aims:

- To continue the **Earth Radiation Budget (ERB)** research initiated by Uvsq-Sat and Inspire-Sat satellites. It intends to achieve broadband ERB measurements using advanced yet simple technologies.
 - To monitor **atmospheric gas concentrations** (CO_2 and CH_4) on a global scale and explore their correlation with Earth's Outgoing Longwave Radiation (**OLR**).
- Uvsq-Sat NG carries multiple payloads, including Earth Radiative Sensors (ERSs) for tracking solar and terrestrial radiation, a Near-Infrared (NIR) Spectrometer for assessing greenhouse gases (GHGs) concentrations, and a high-definition camera (NanoCam) for Earth imaging. The NanoCam helps with geolocating observed scenes and provides an opportunity to estimate the **vertical temperature profile of the atmosphere** by observing the Earth's limb.
- We will also endeavor to capture images of the aurora between 60 and 80 geomagnetic latitude both above North and South oval. Nadir pointing or close Nadir pointing is convenient but limb geometry could also be very interesting. The goal is to conduct a study on **auroral structures**, with a specific emphasis on the less commonly observed sub-auroral features.

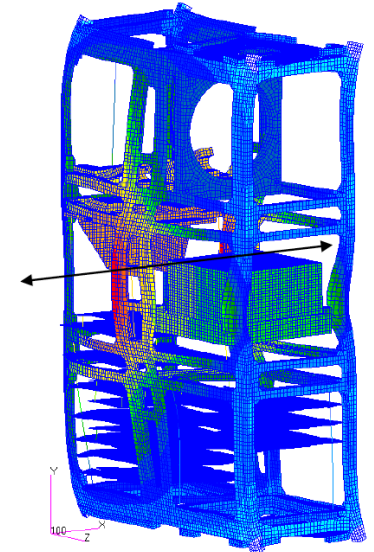
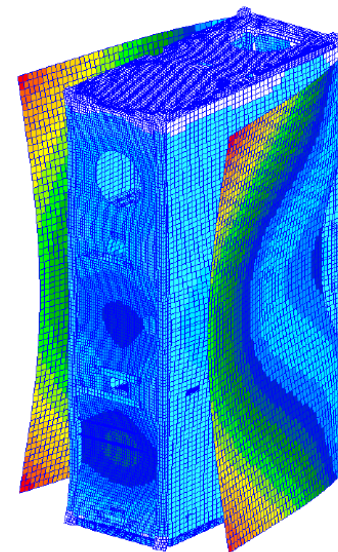
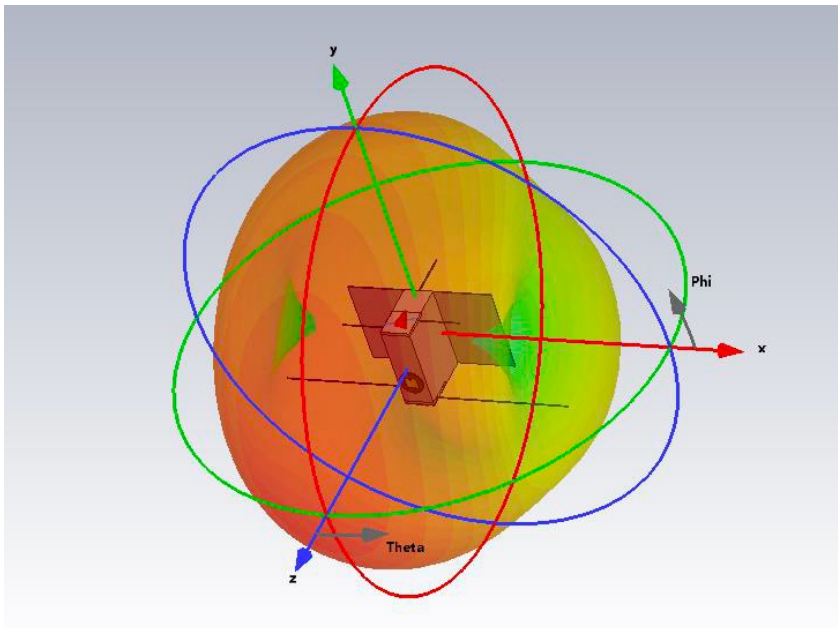
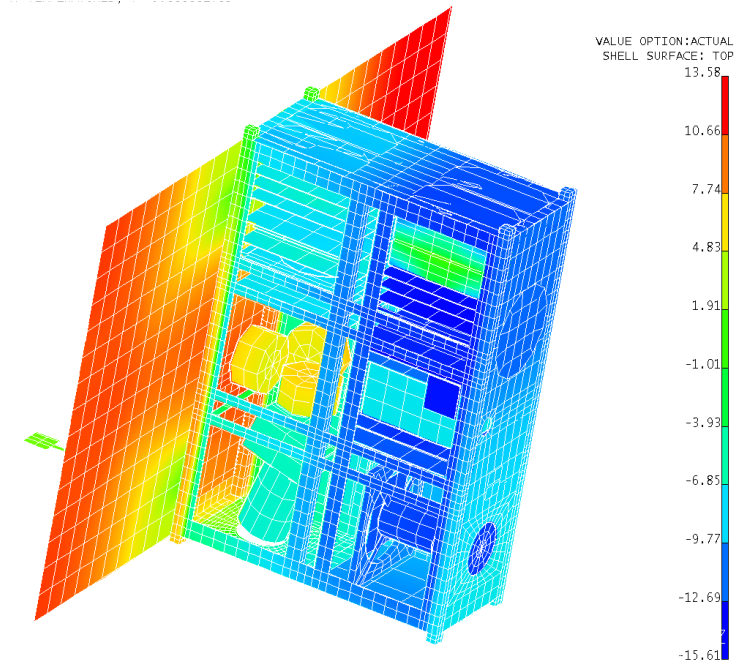
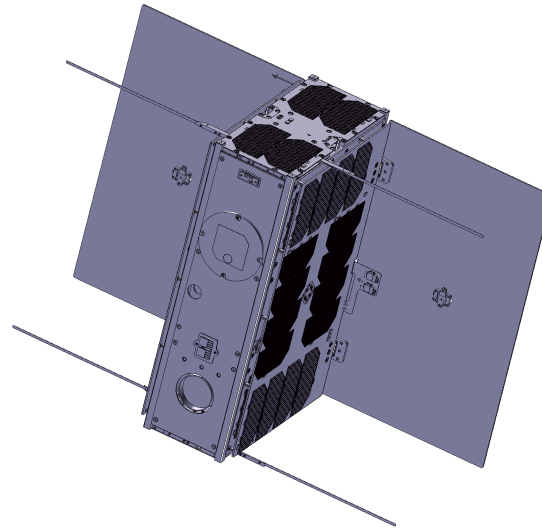
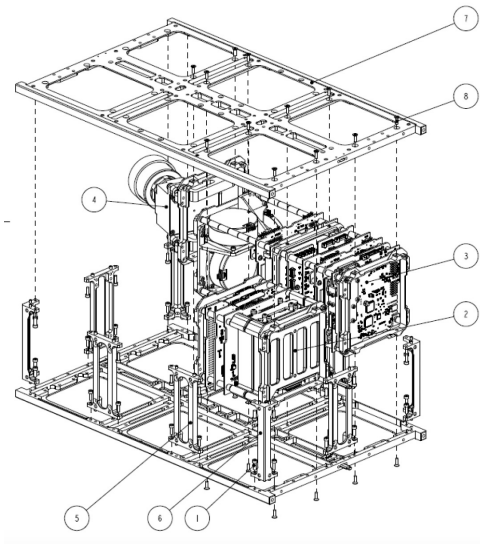
Uvsq-Sat NG a satellite for observing Earth



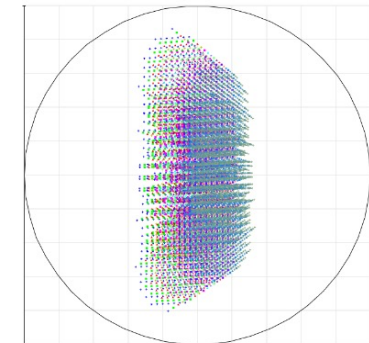
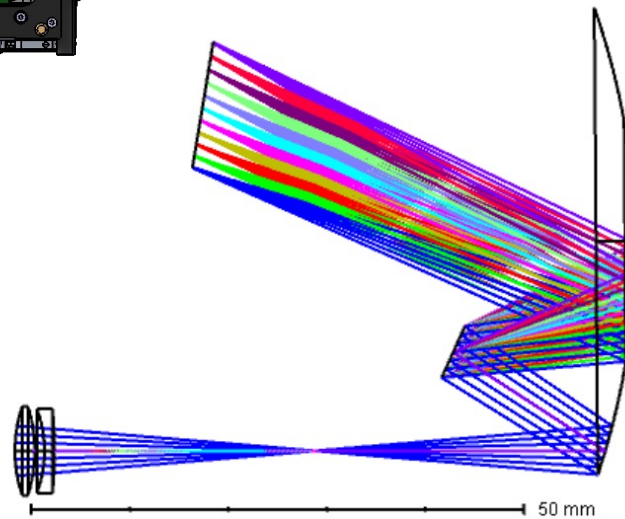
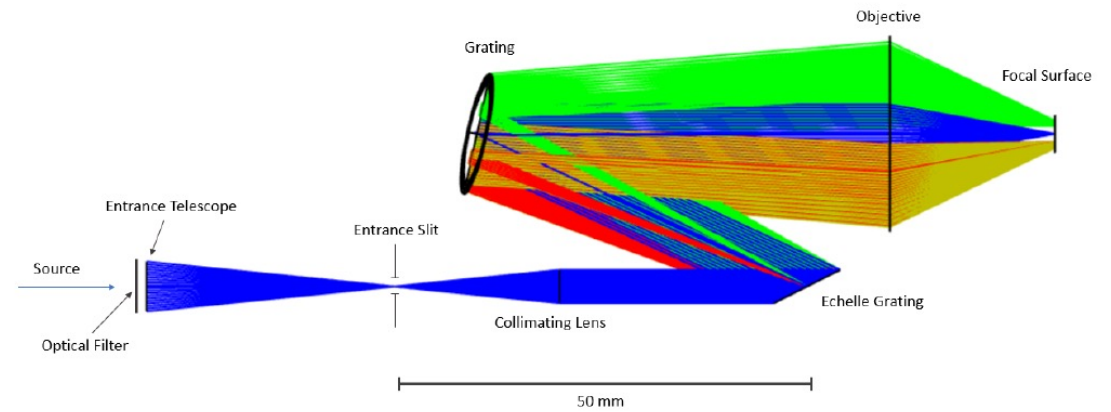
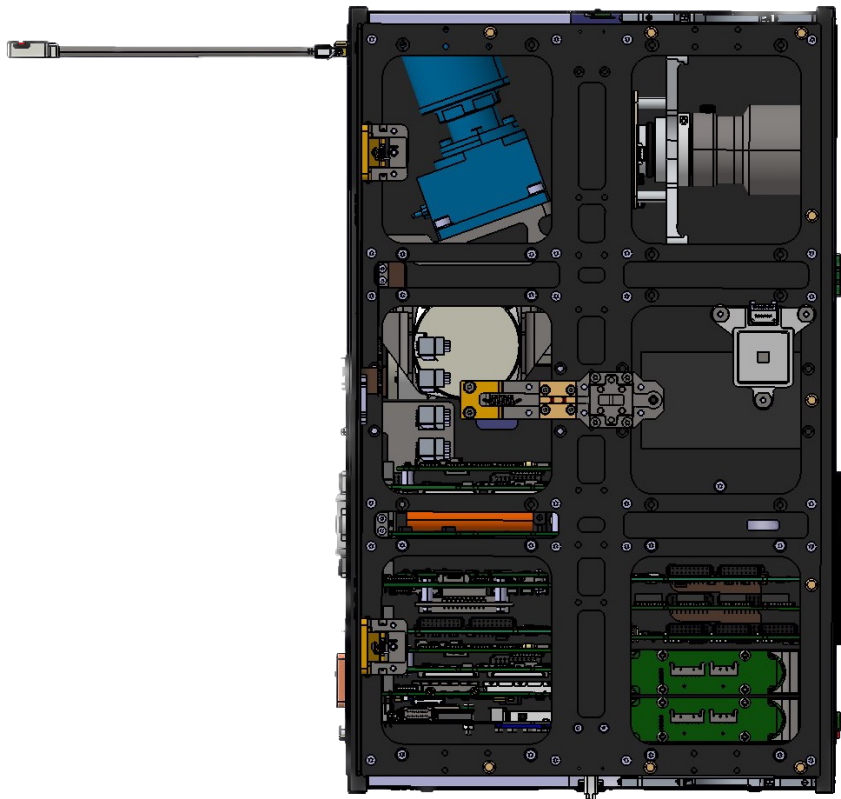
Properties	Value	Comments
Orbit	Sun-Synchronous Orbit (SSO)	Maximum altitude of 600 km, LTAN of 06:30
Design life time	Minimum of 2 years in LEO	3 years desired
Launch date	Between Q2 2025 and Q1 2026	Launch vehicle: Falcon 9, Vega-C or Z�phyr
Launch adapter	QuadPack or EXOpod deployer	Payload mass up to 12 kg
CubeSat type	6U XL	Easy-to-assemble modular design
Launch mass	10.0 kg ¹	Maximum with margins
Dimensions	10.0 cm � 36.6 cm � 22.6 cm	Stowed along X, Y, and Z axes
	111.3 cm � 36.6 cm � 38.8 cm	Unstowed including all deployable elements

Uvsq-Sat NG, a new satellite to envision the space of tomorrow. An In-Orbit Demonstrator to prepare the SmallSats constellations of the future.

Uvsq-Sat NG a satellite for observing Earth

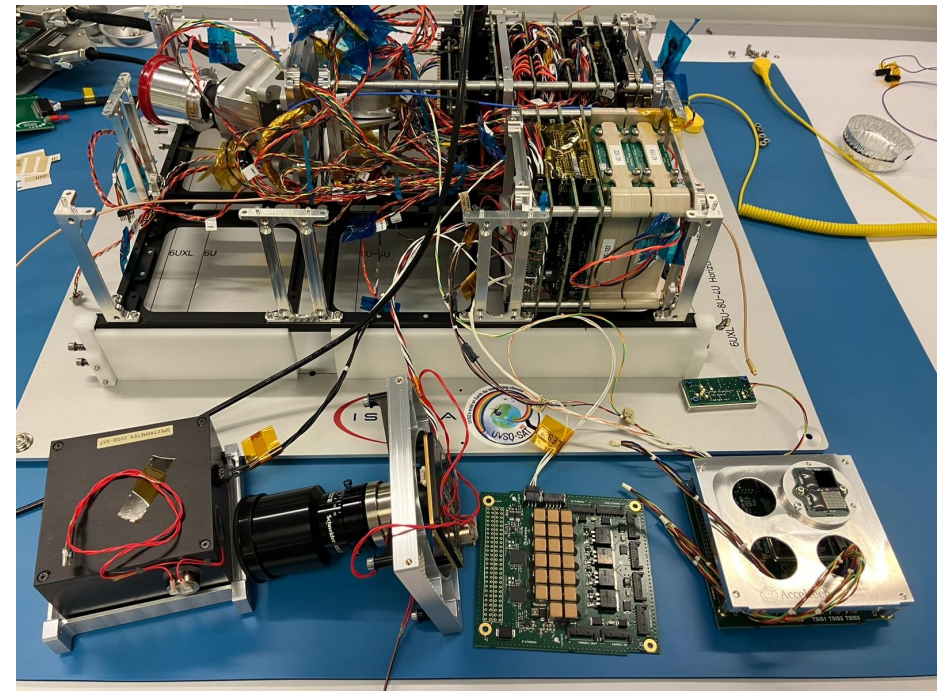
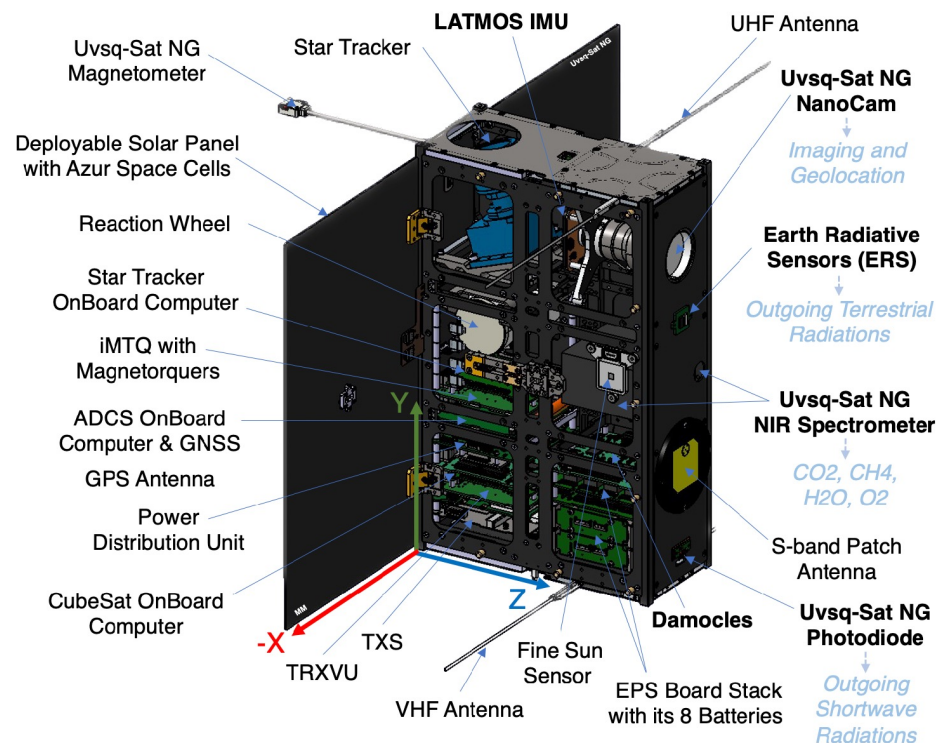


Uvsg-Sat NG a satellite for observing Earth

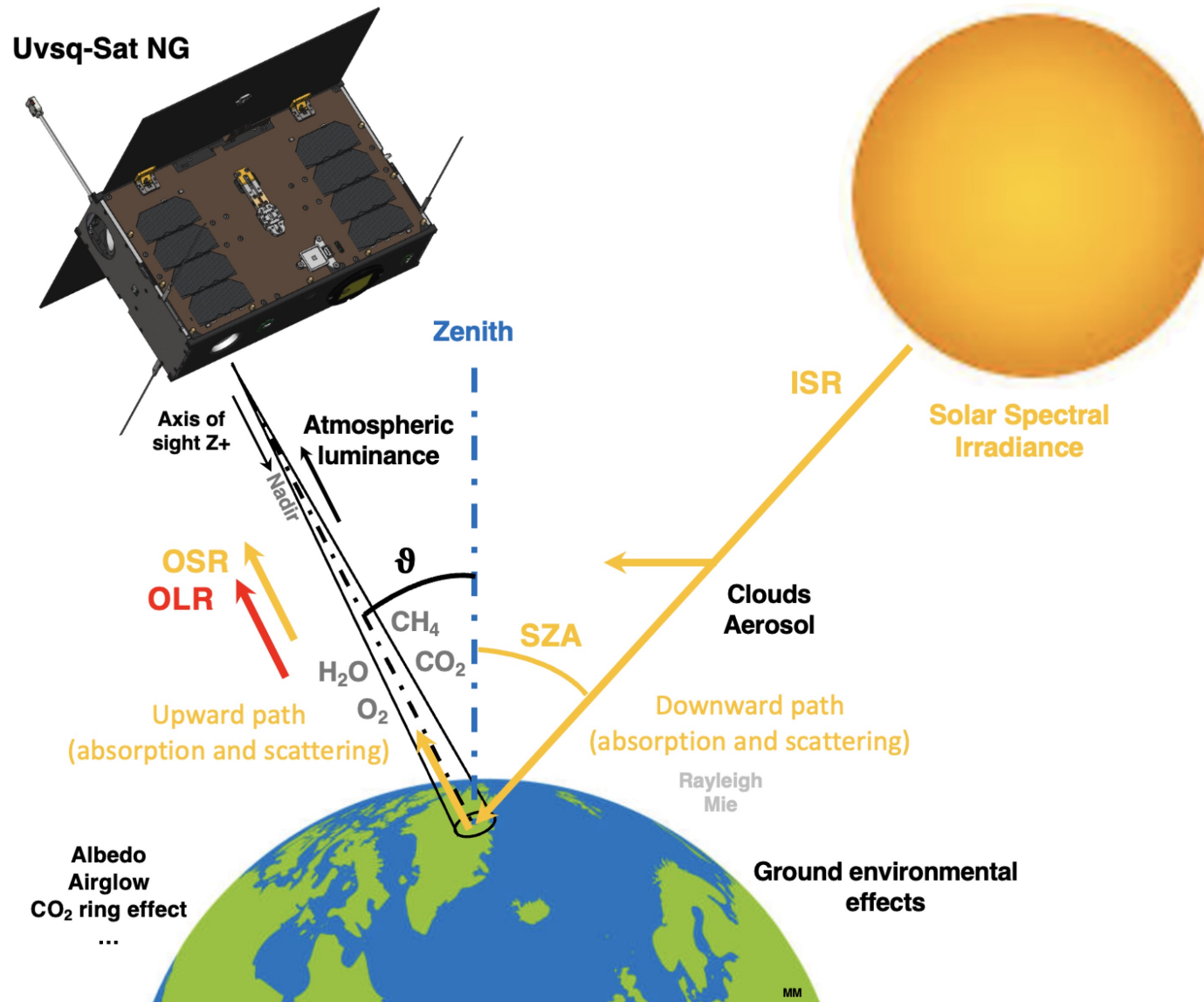


Uvsq-Sat NG a satellite for observing Earth

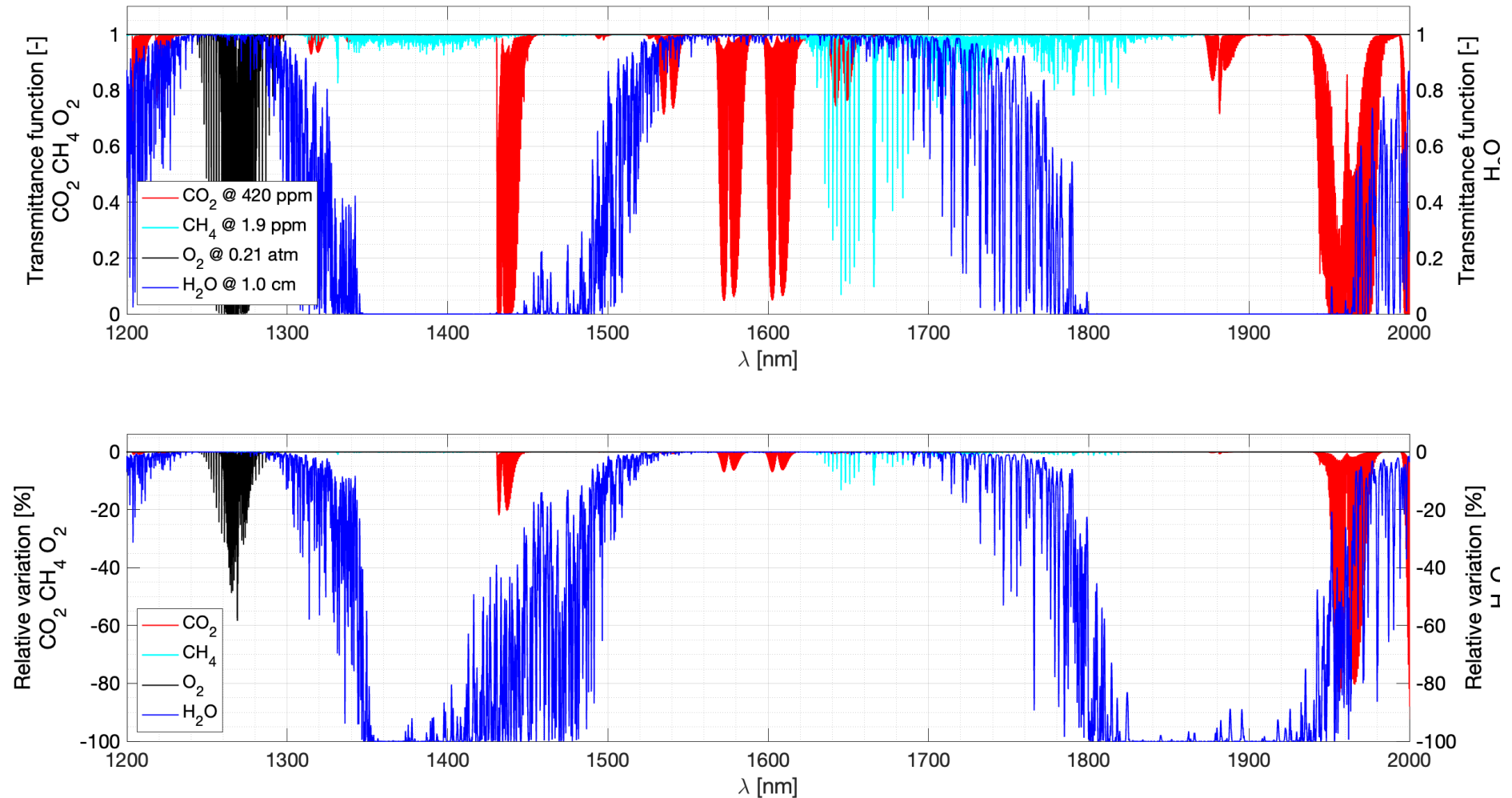
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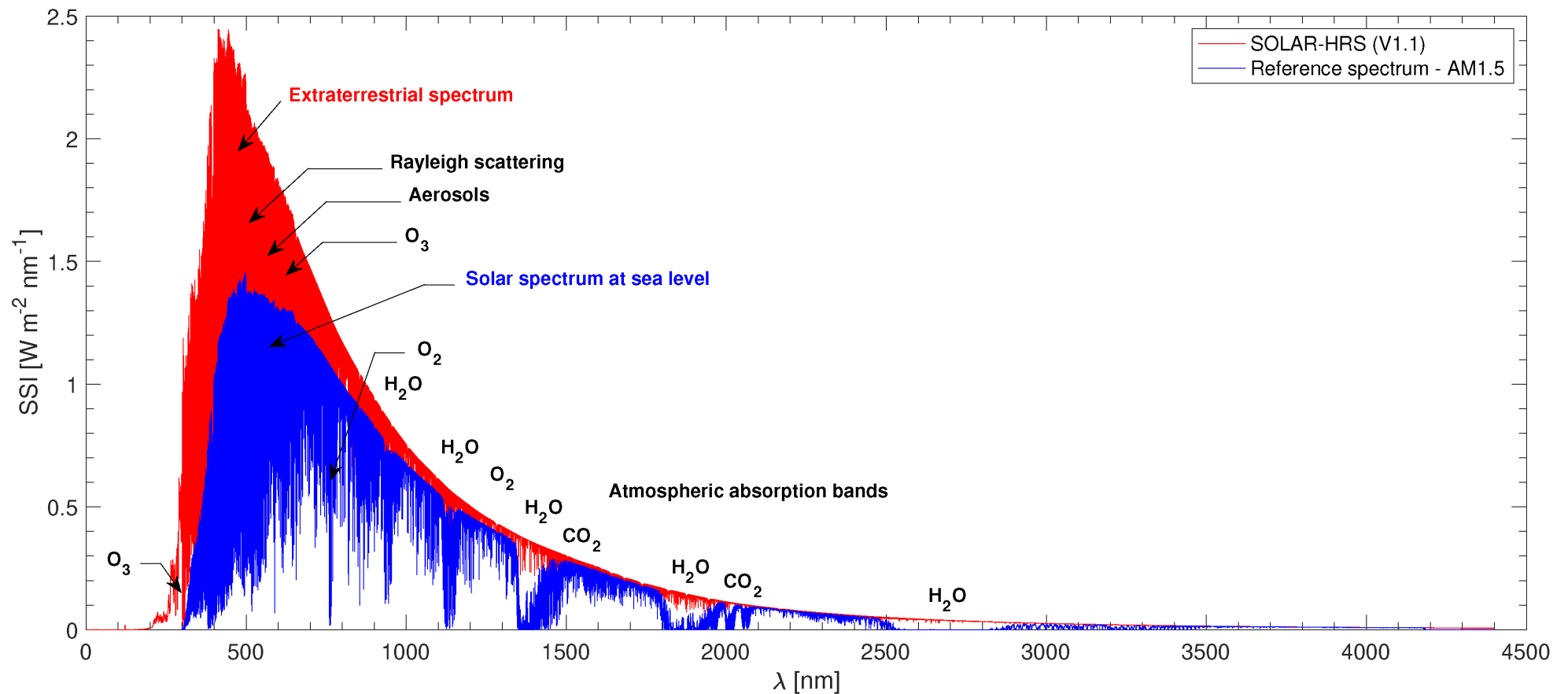
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Uvsg-Sat NG a satellite for observing Earth



Uvsq-Sat NG a satellite for observing Earth



Uvsq-Sat NG a satellite for observing Earth

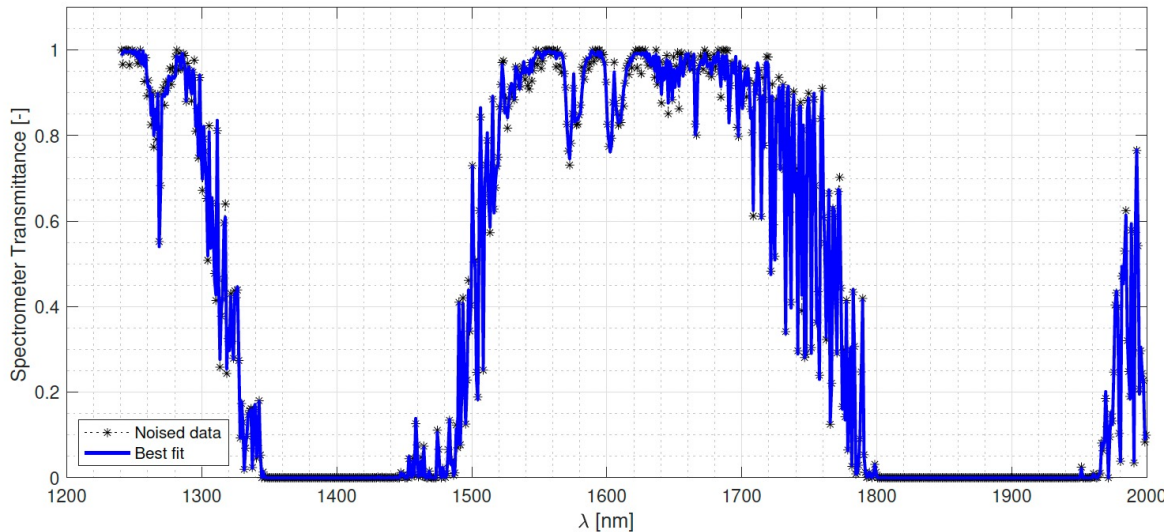
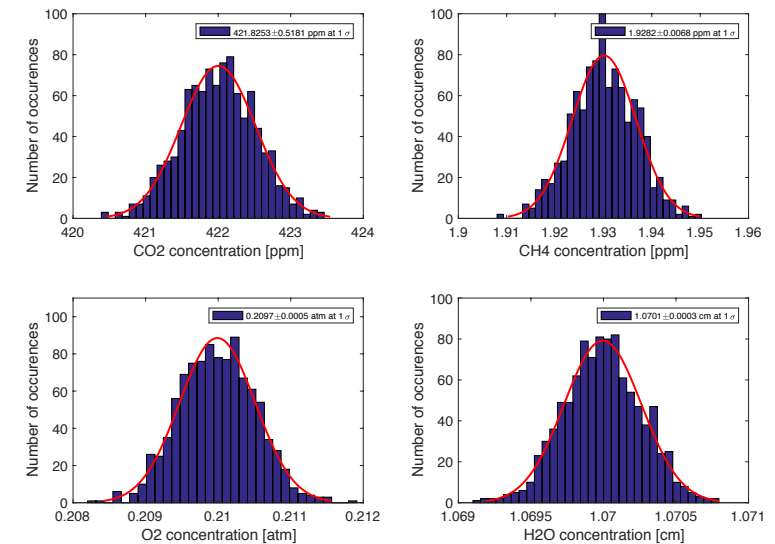


Table 5. Uncertainties of atmospheric gas concentrations (1-Sigma) for various data retrievals based on different instrumental characteristics.

Resolution: 1 nm						
SNR	50	100	250	500	1,000	2,000
CO ₂ [ppm]	10.998	5.602	2.204	1.130	0.575	0.277
CH ₄ [ppb]	125.028	66.209	25.245	12.302	6.625	3.108
O ₂ [Ratio]	11.024E-3	5.921E-3	2.433E-3	1.165E-3	0.636E-3	0.299E-3
H ₂ O [cm]	4.746E-3	2.271E-3	0.877E-3	0.441E-3	0.207E-3	0.114E-3
Resolution: 6 nm						
SNR	50	100	250	500	1,000	2,000
CO ₂ [ppm]	33.974	16.720	6.426	3.154	1.674	0.808
CH ₄ [ppb]	431.491	198.877	88.926	40.973	21.593	11.317
O ₂ [Ratio]	33.139E-3	16.209E-3	5.657E-3	3.169E-3	1.588E-3	0.850E-3
H ₂ O [cm]	12.474E-3	5.933E-3	2.518E-3	1.236E-3	0.609E-3	0.284E-3

The Levenberg-Marquardt algorithm is used to fit a model that relates the observed dimensionless transmittance functions to the concentrations of the atmospheric gases.

The Monte Carlo method is used to perform multiple simulations with randomized inputs within specified uncertainty bounds. This helps to estimate the range of gases concentrations (CO₂, CH₄, O₂, H₂O) and their associated uncertainties.



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Uvsq-Sat NG instrument spectral resolution: 1 nm				
Surface / Aerosols	Pine forest (a)	Deciduous forest (b)	Ocean (c)	Homogeneous snow (d)
Continental	0.5 ppm	0.4 ppm	77.6 ppm	0.3 ppm
Desert	0.5 ppm	0.3 ppm	82.8 ppm	0.3 ppm
Maritime	0.6 ppm	0.4 ppm	81.4 ppm	0.3 ppm
Urban	0.5 ppm	0.4 ppm	78.4 ppm	0.3 ppm
Uvsq-Sat NG instrument spectral resolution: 5 nm				

Surface / Aerosols	Pine forest (a)	Deciduous forest (b)	Ocean (c)	Homogeneous snow (d)
Continental	1.3 ppm	0.9 ppm	234.5 ppm	0.7 ppm
Desert	1.7 ppm	0.8 ppm	225.8 ppm	0.6 ppm
Maritime	1.4 ppm	1.1 ppm	228.6 ppm	0.8 ppm
Urban	1.3 ppm	0.9 ppm	233.2 ppm	0.7 ppm

CO₂ uncertainties (at 1 σ) determination according to the various simulation cases (requirements: 1 ppm).

Uvsq-Sat NG instrument spectral resolution: 1 nm				
Surface / Aerosols	Pine forest (a)	Deciduous forest (b)	Ocean (c)	Homogeneous snow (d)
Continental	4.9 ppb	3.7 ppb	194.1 ppb	2.5 ppb
Desert	4.4 ppb	3.2 ppb	184.8 ppb	2.4 ppb
Maritime	5.8 ppb	4.2 ppb	202.2 ppb	3.2 ppb
Urban	4.7 ppb	3.4 ppb	193.4 ppb	2.8 ppb
Uvsq-Sat NG instrument spectral resolution: 5 nm				

Surface / Aerosols	Pine forest (a)	Deciduous forest (b)	Ocean (c)	Homogeneous snow (d)
Continental	12.2 ppb	10.2 ppb	735.6 ppb	7.8 ppb
Desert	10.5 ppb	8.5 ppb	710.8 ppb	7.0 ppb
Maritime	15.5 ppb	12.7 ppb	763.2 ppb	8.8 ppb
Urban	12.2 ppb	10.3 ppb	730.5 ppb	7.1 ppb

CH₄ uncertainties (at 1 σ) determination according to the various simulation cases (requirements: 10 ppb).



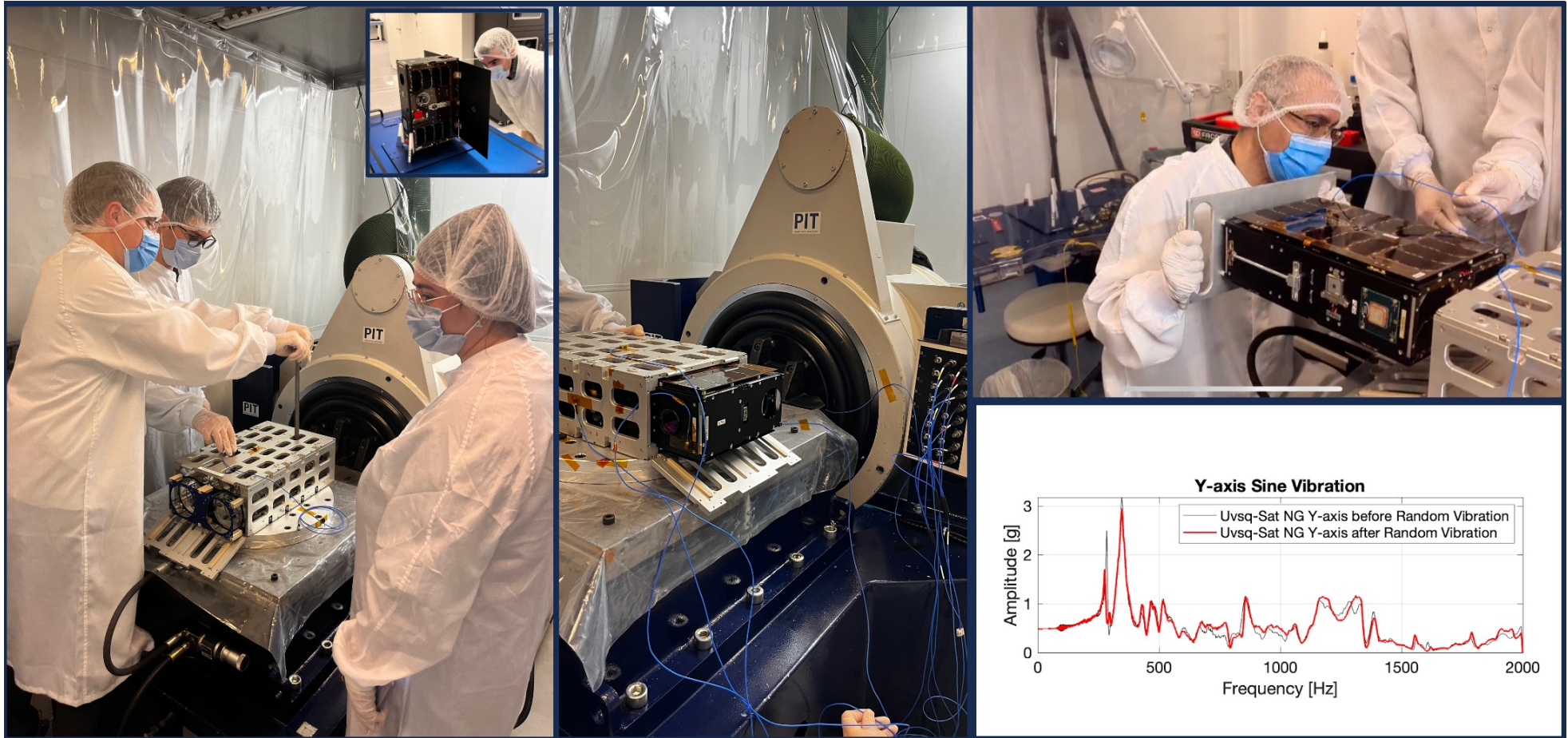
UVSQ-Sat NG



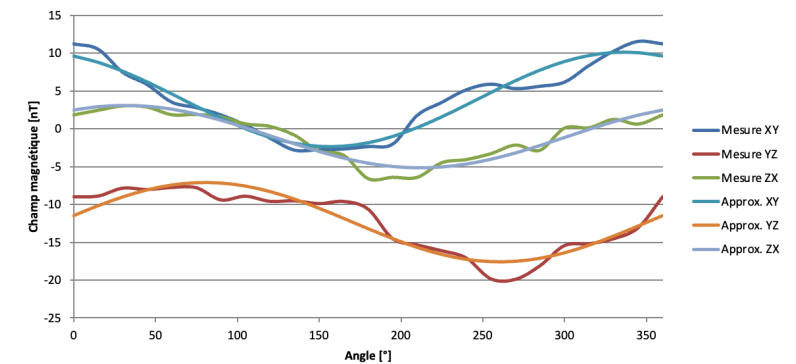
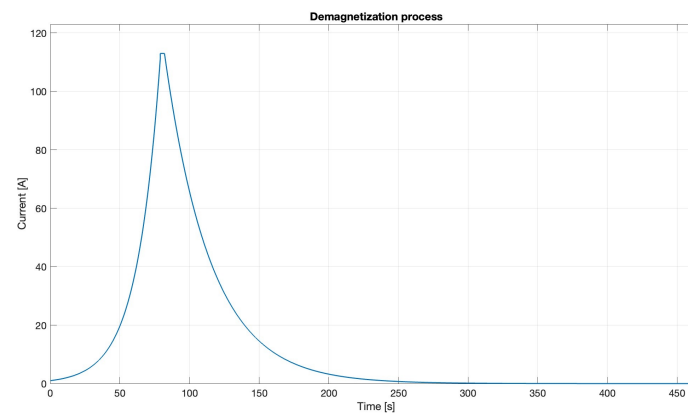
UVSQ-Sat NG objectives include ensuring continuity of the Earth Radiation Budget (ERB) initiated via the UVSQ-Sat and Inspire-Sat satellites, achieving broadband ERB measurements, and conducting precise and comprehensive monitoring of atmospheric gas concentrations (CH₄, CO₂) on a global scale. [More...](#)

Clavier et al., 2024

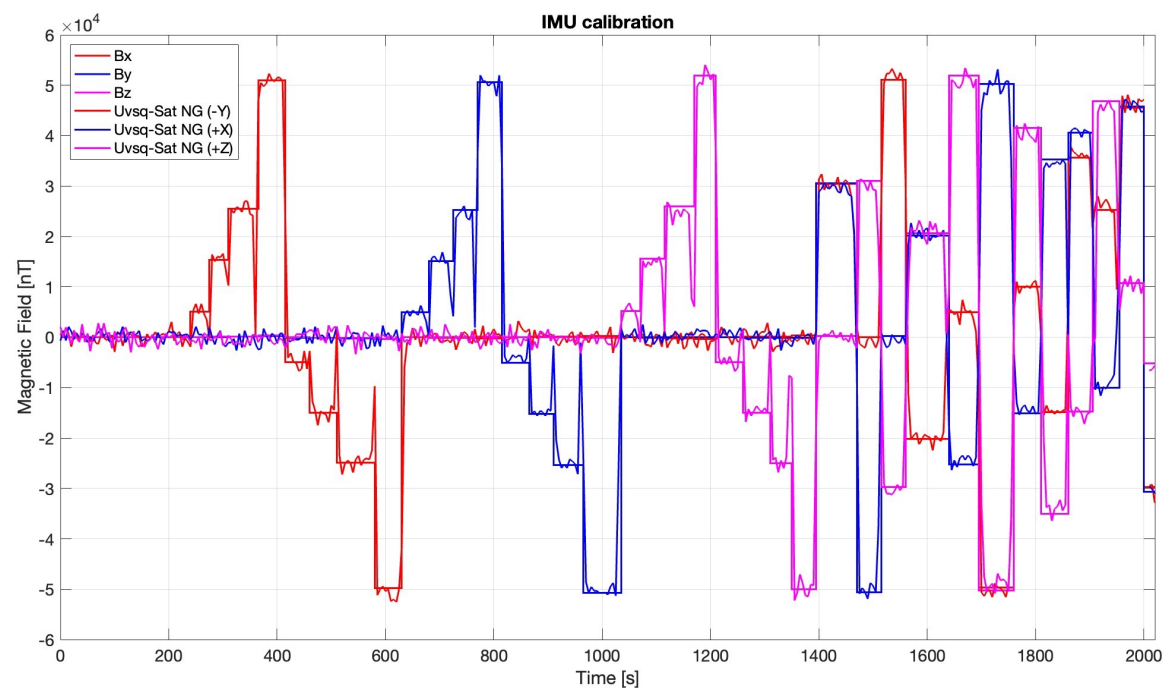
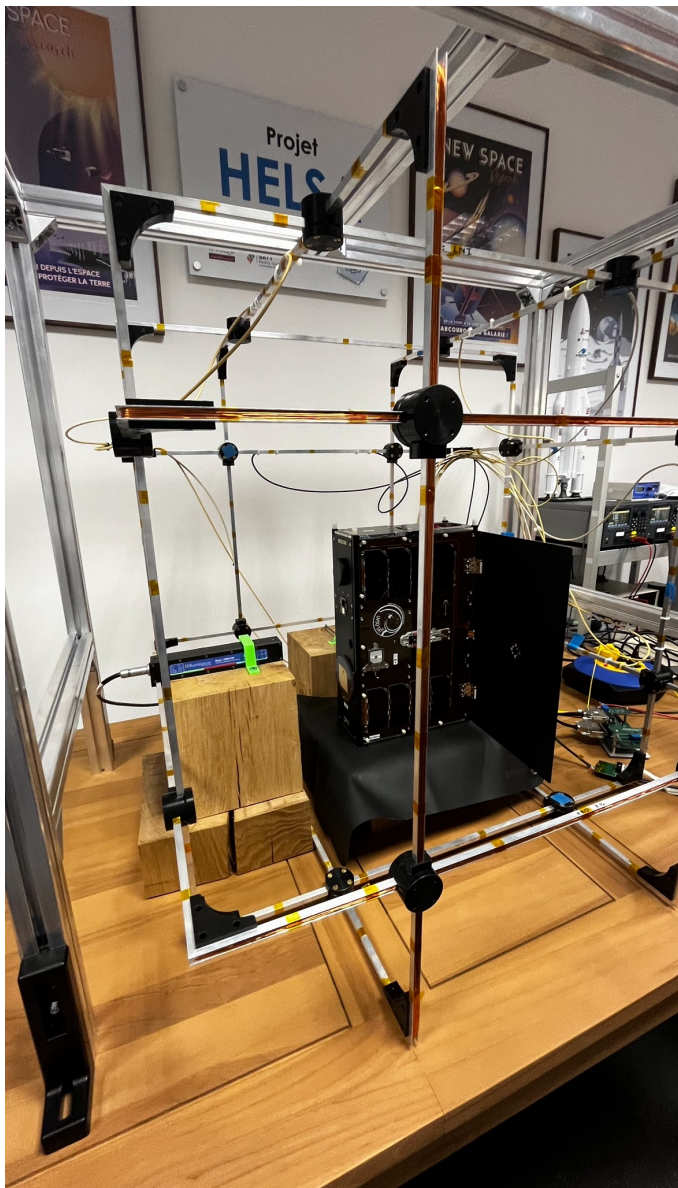
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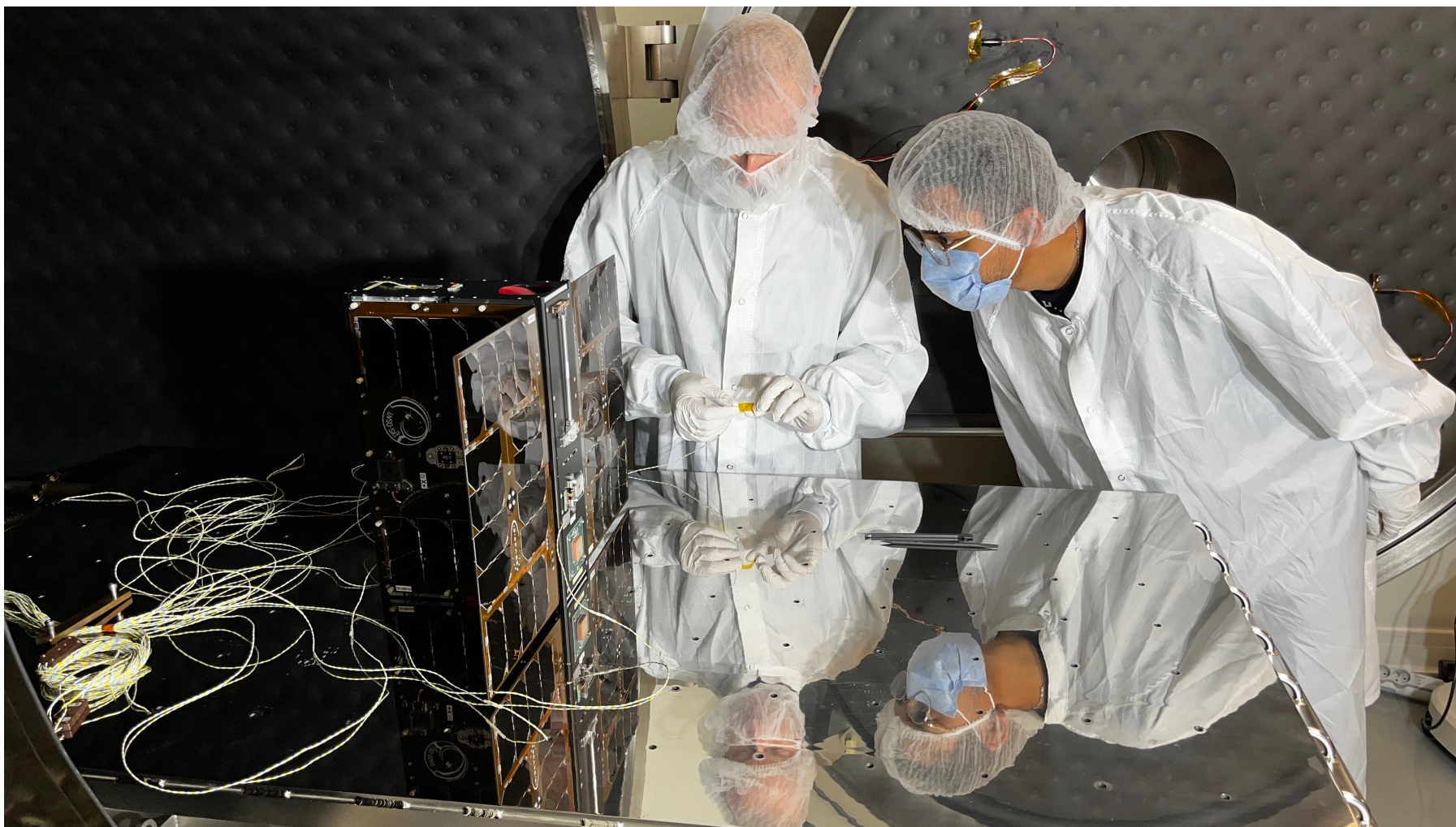
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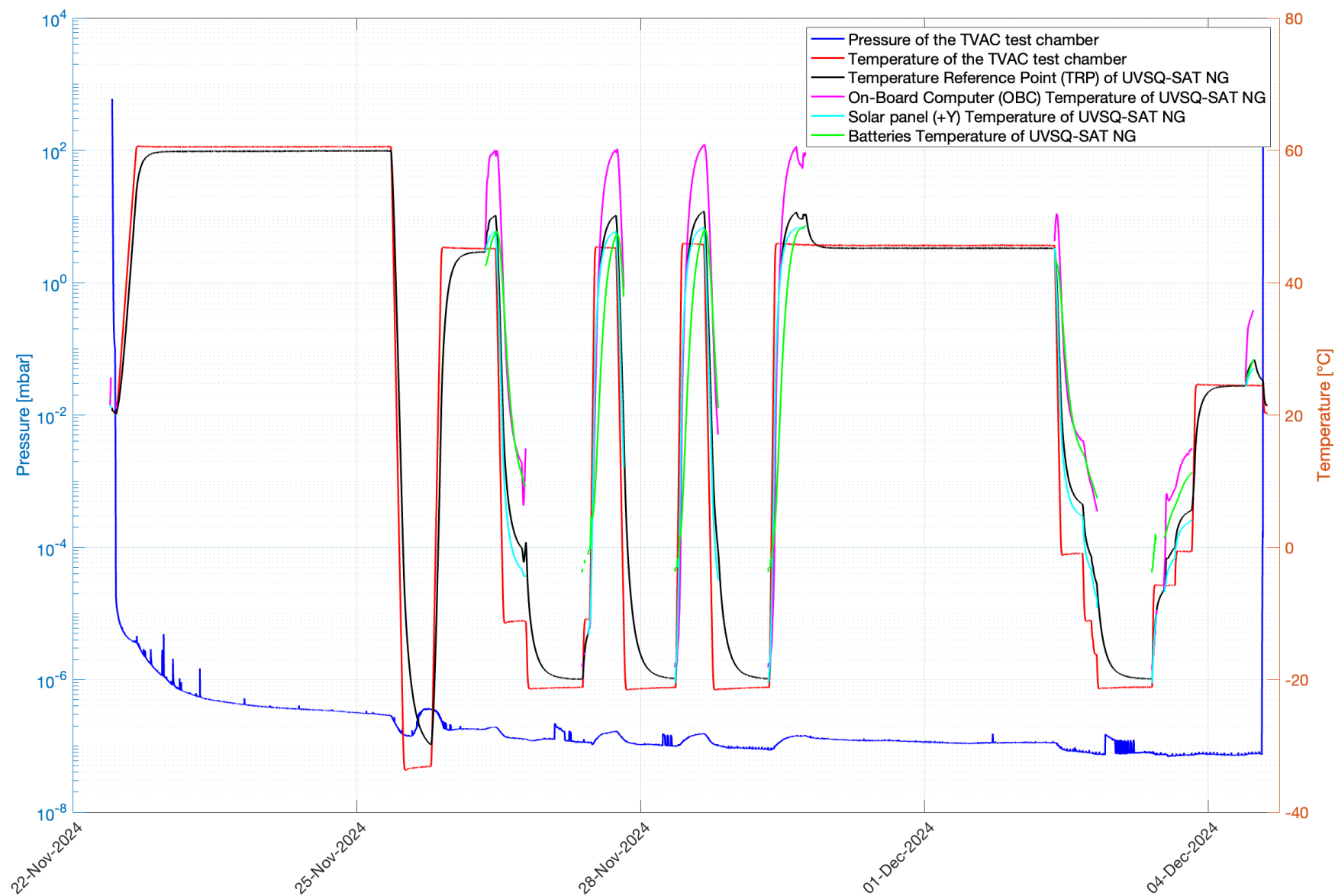
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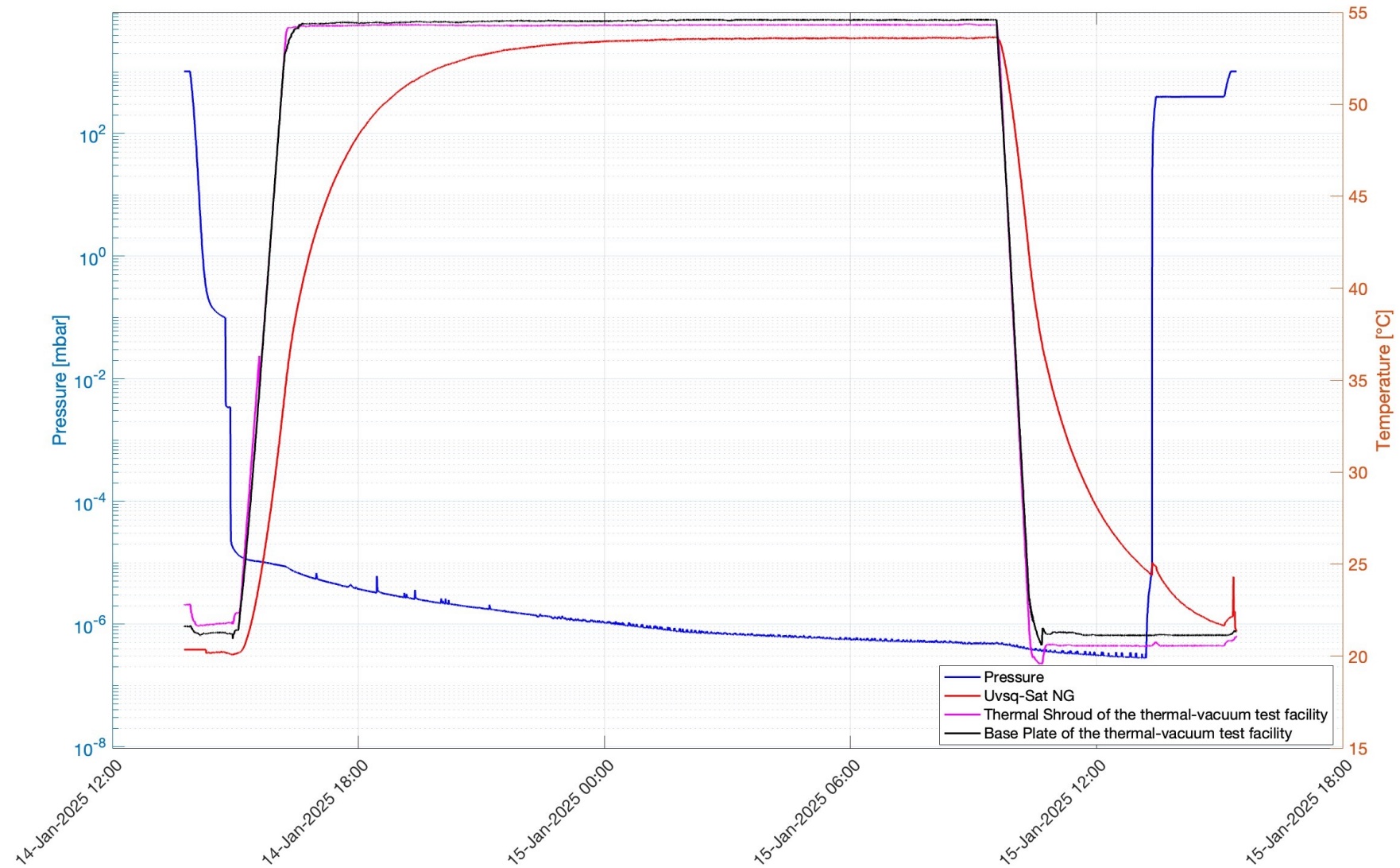
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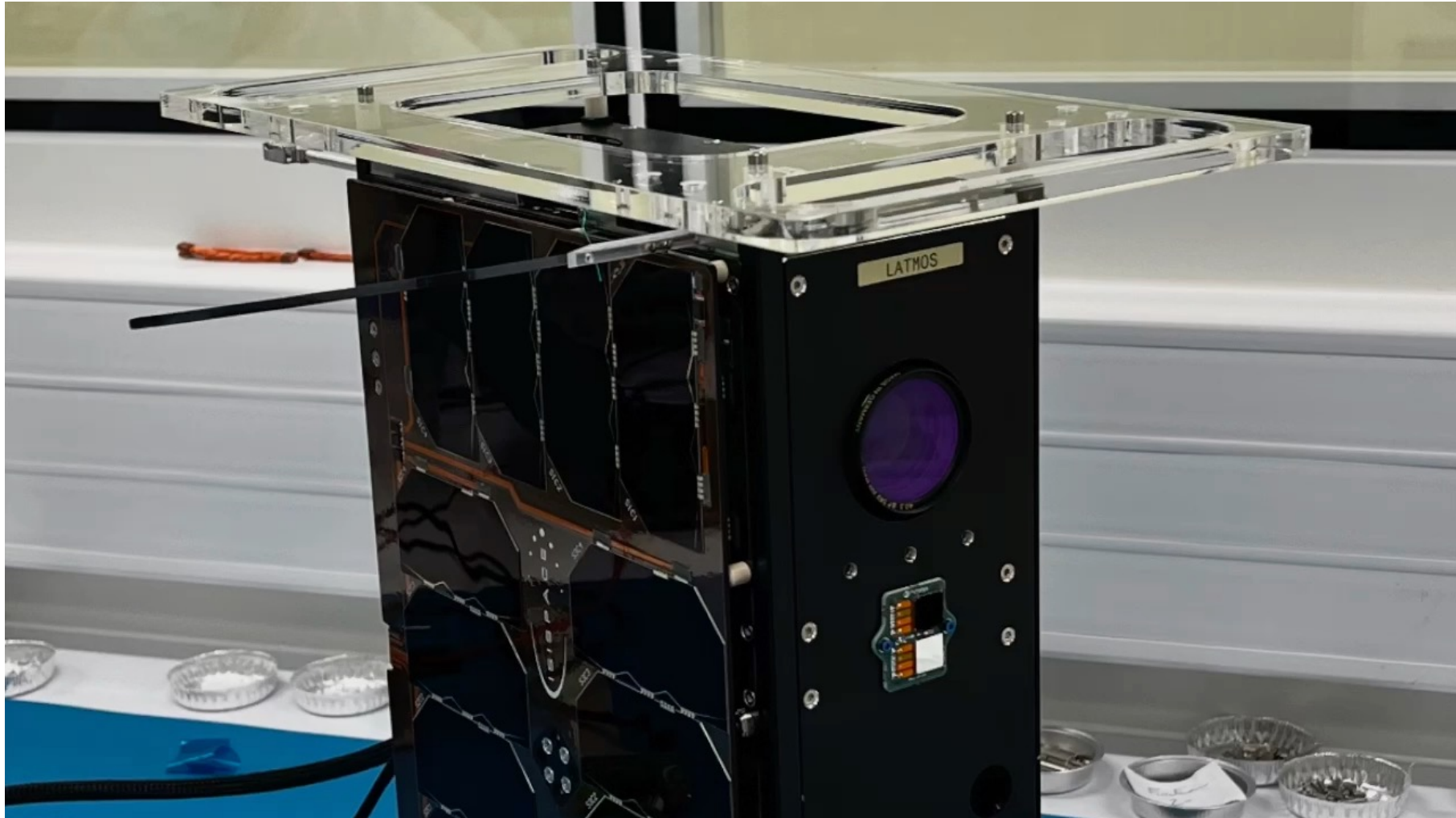
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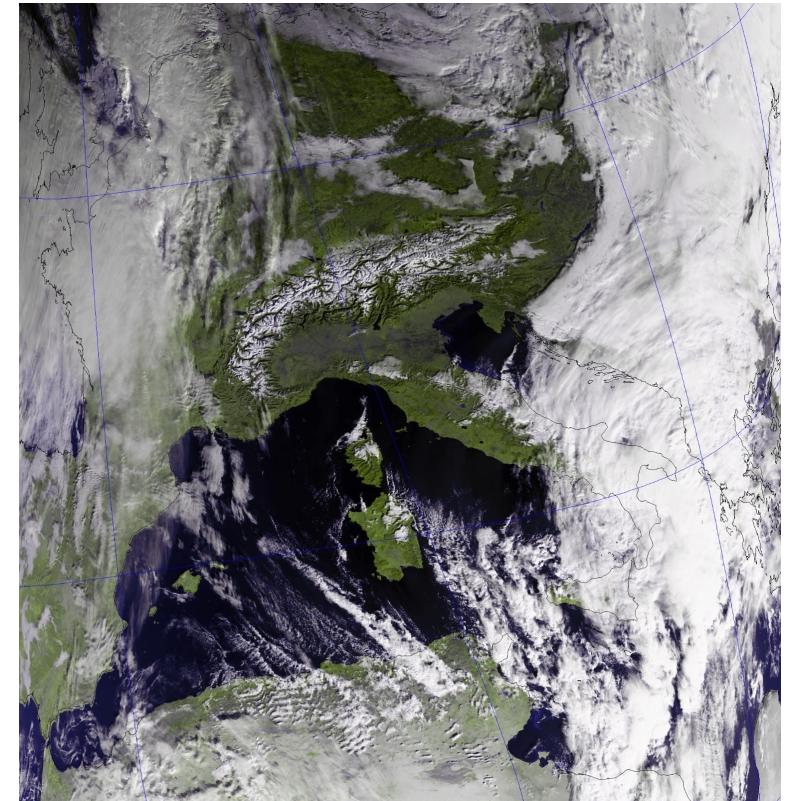
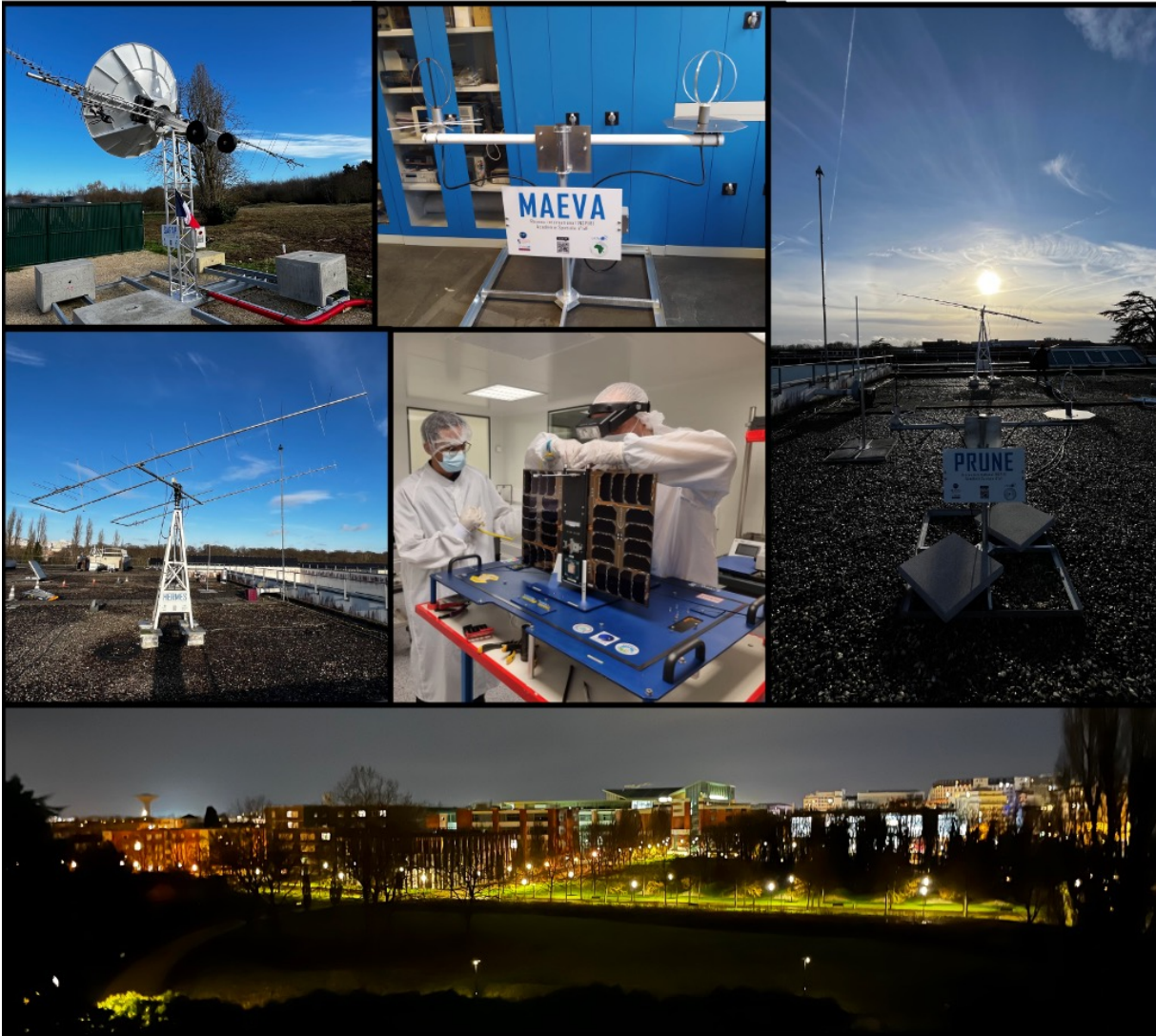
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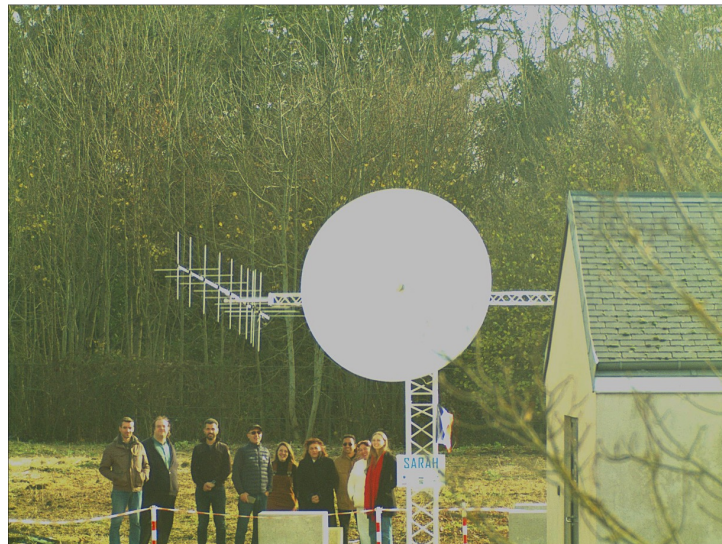
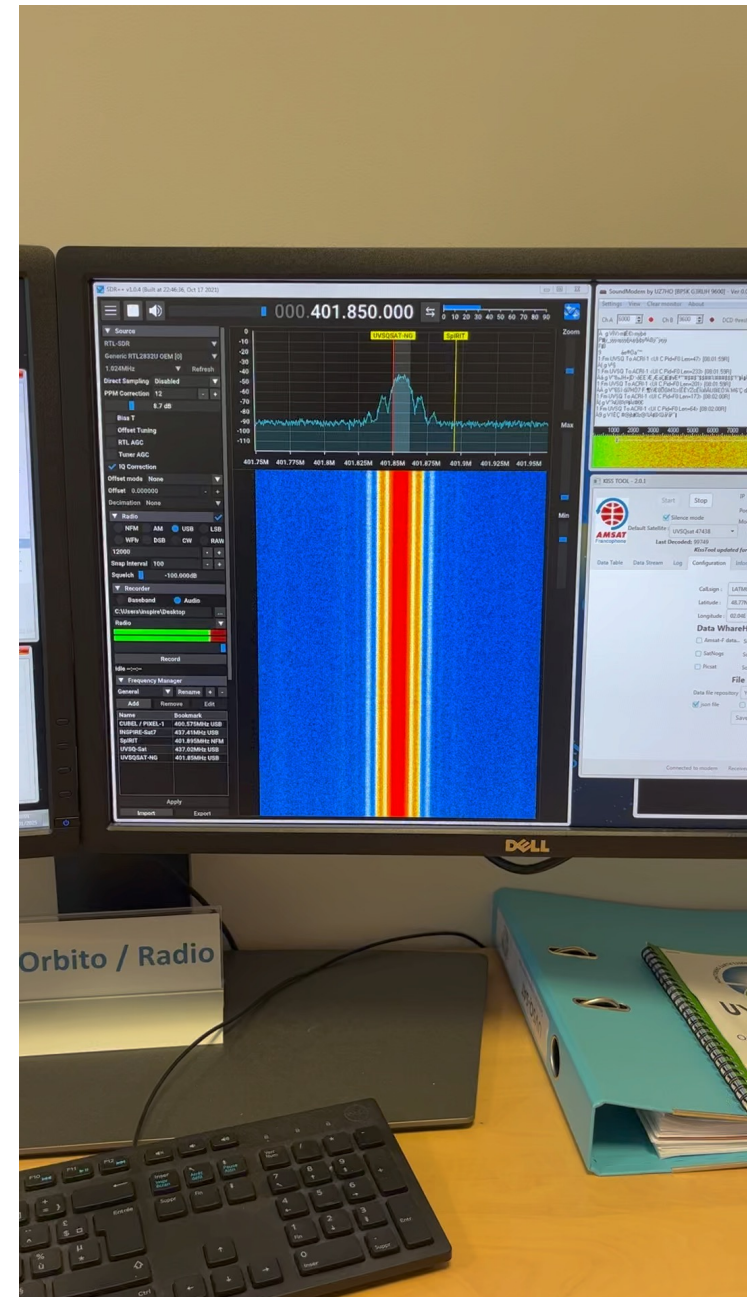
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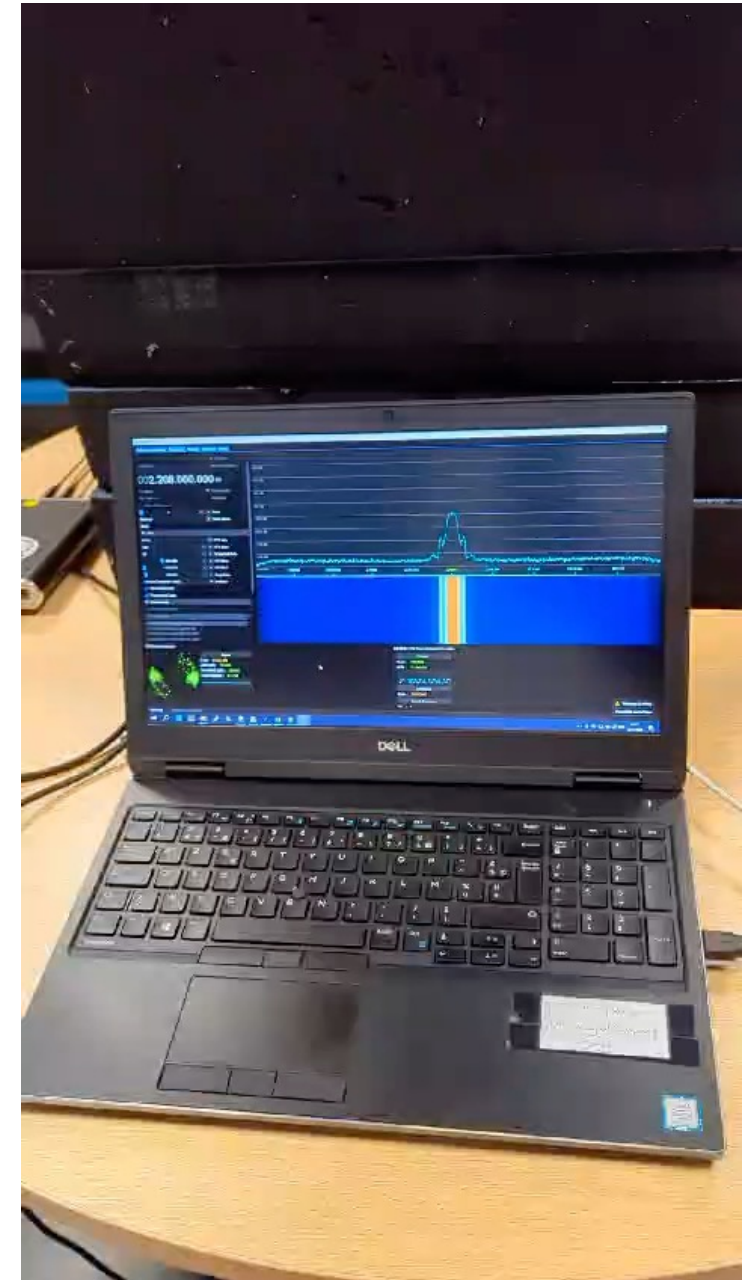
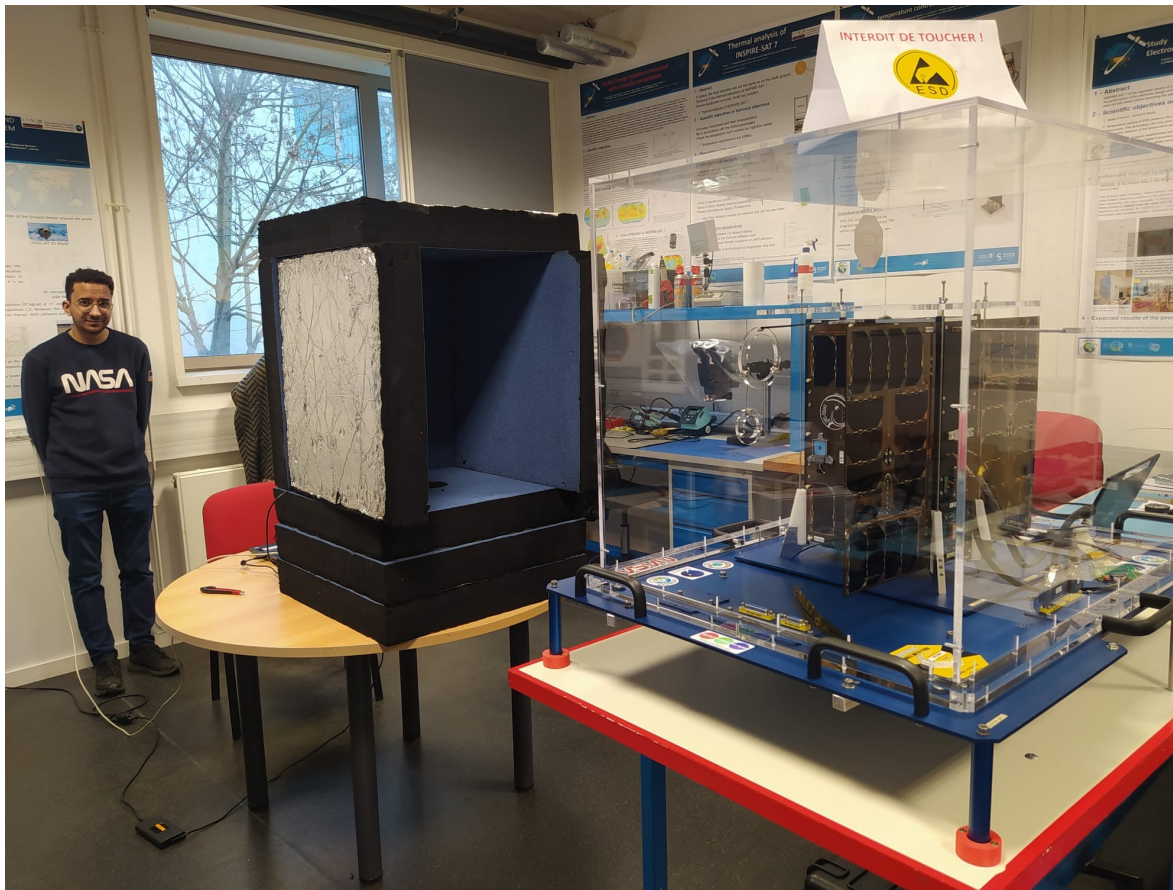
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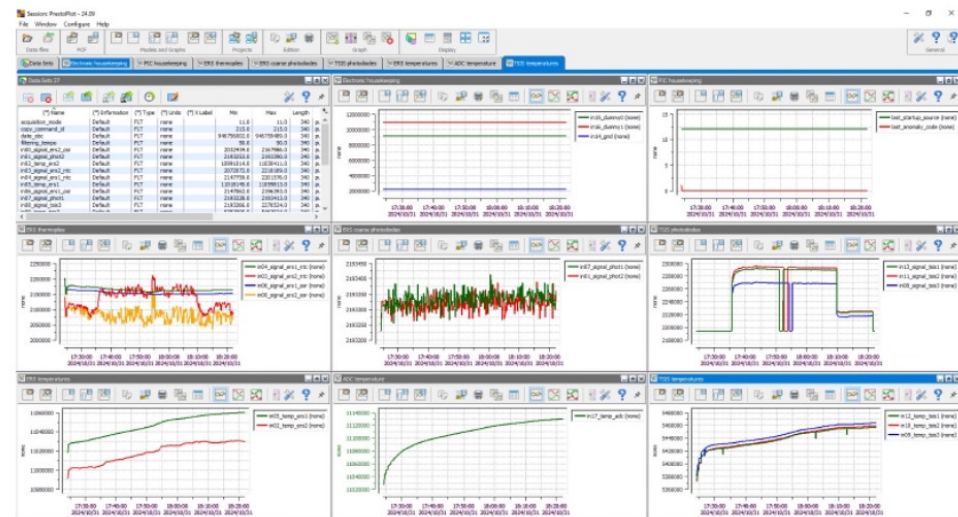
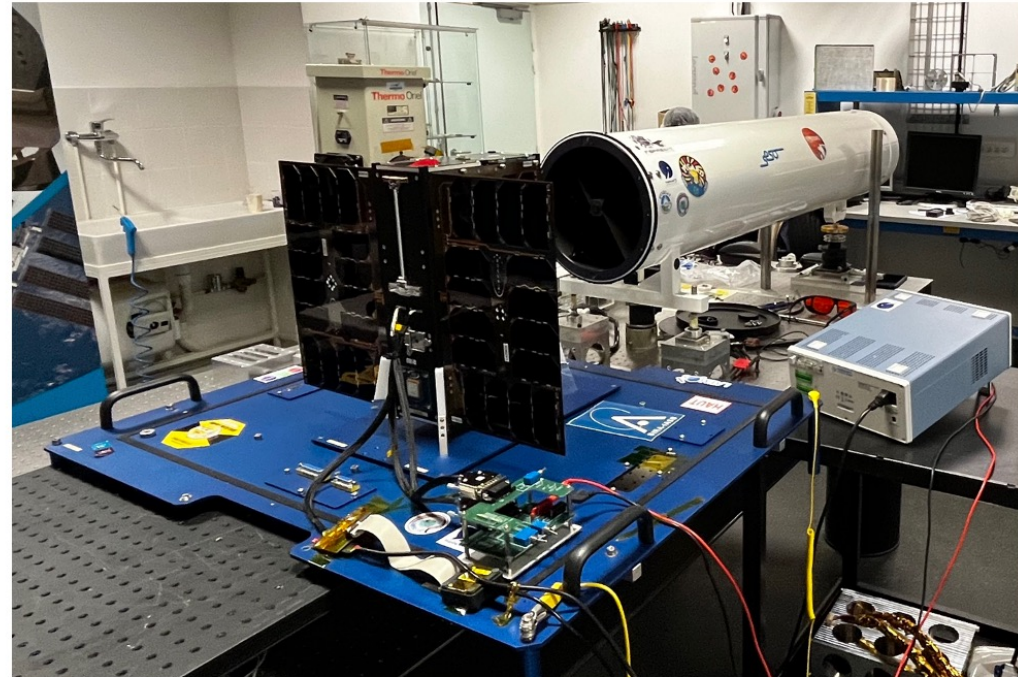
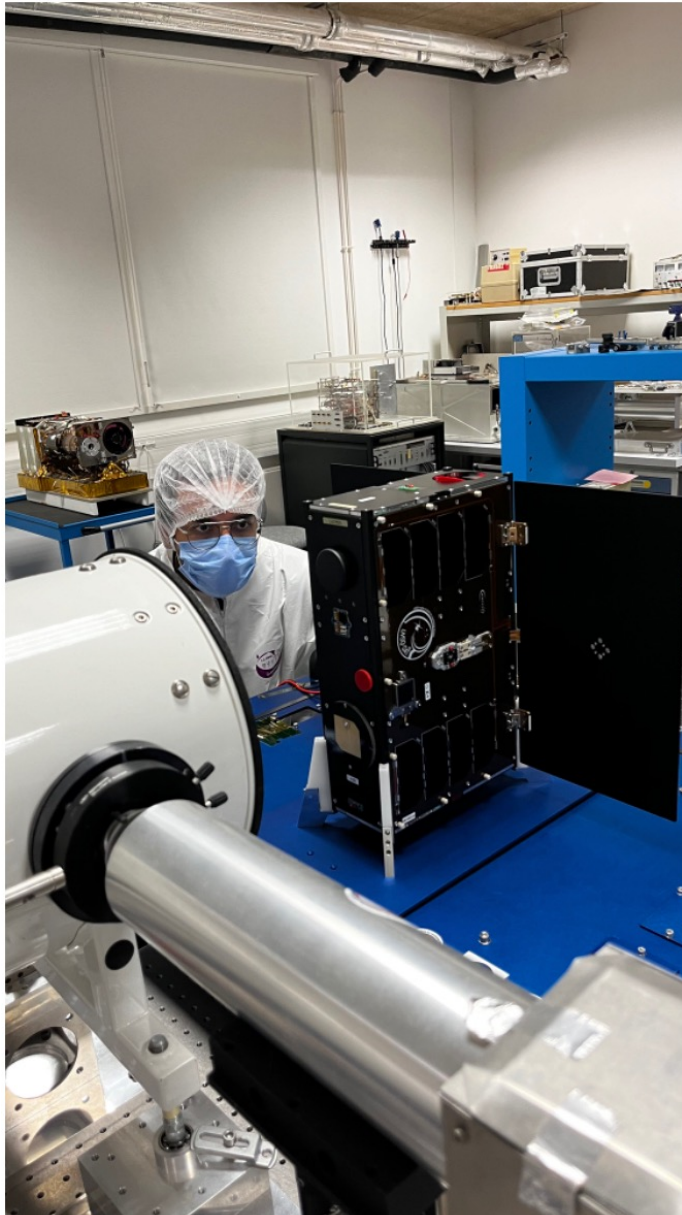
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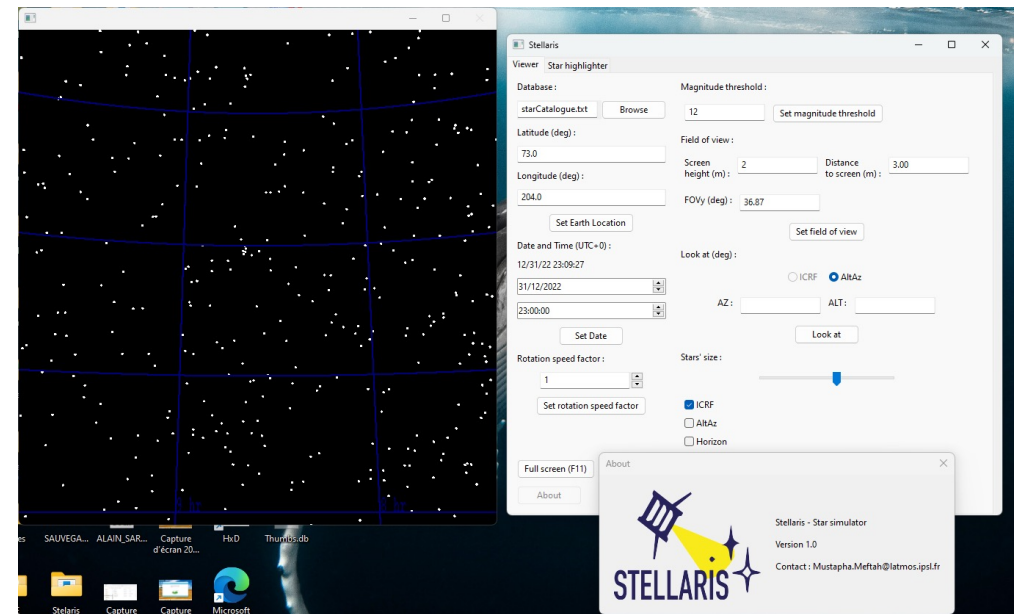
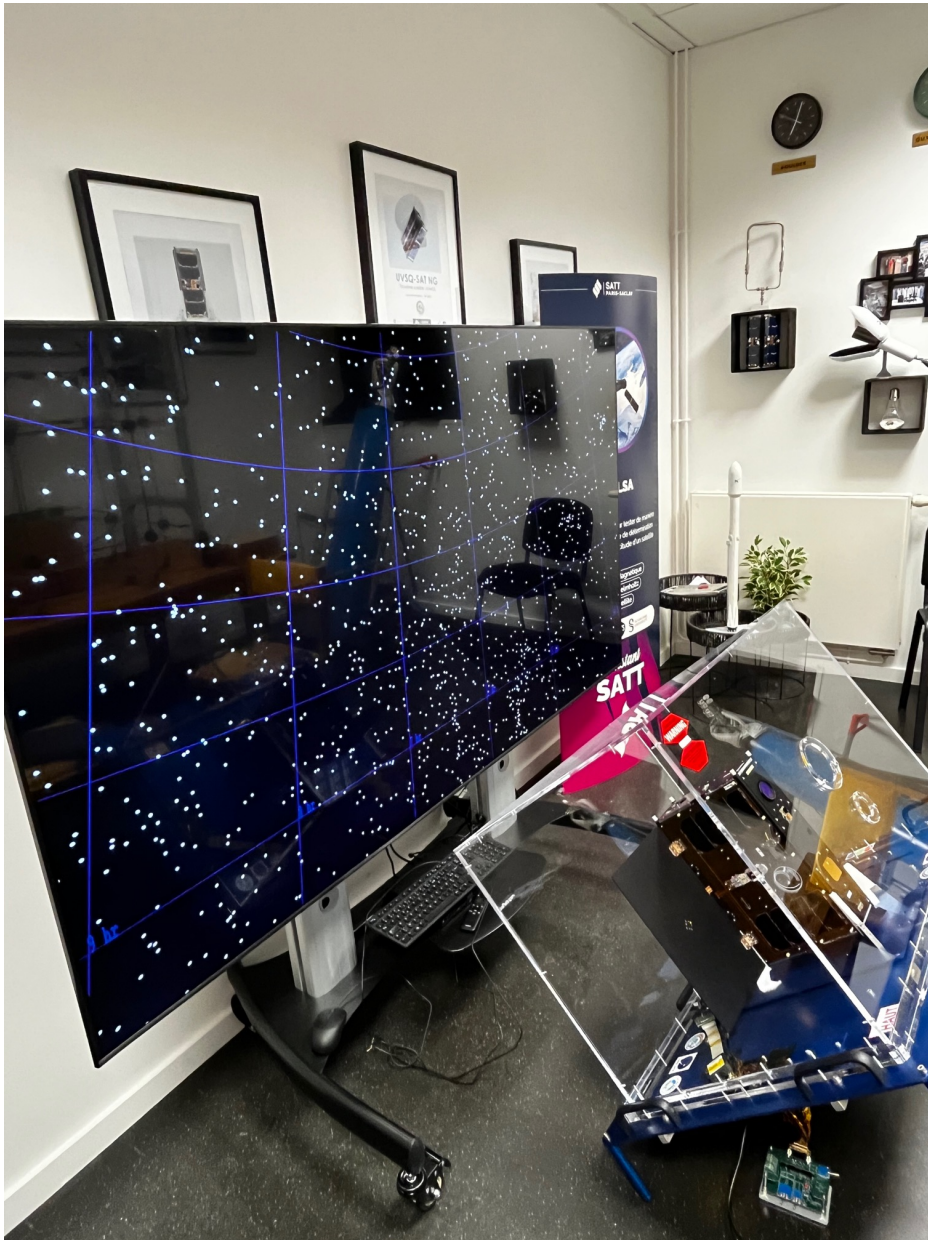
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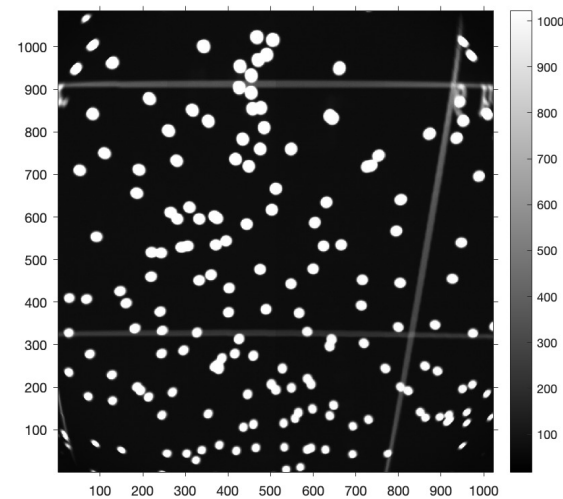
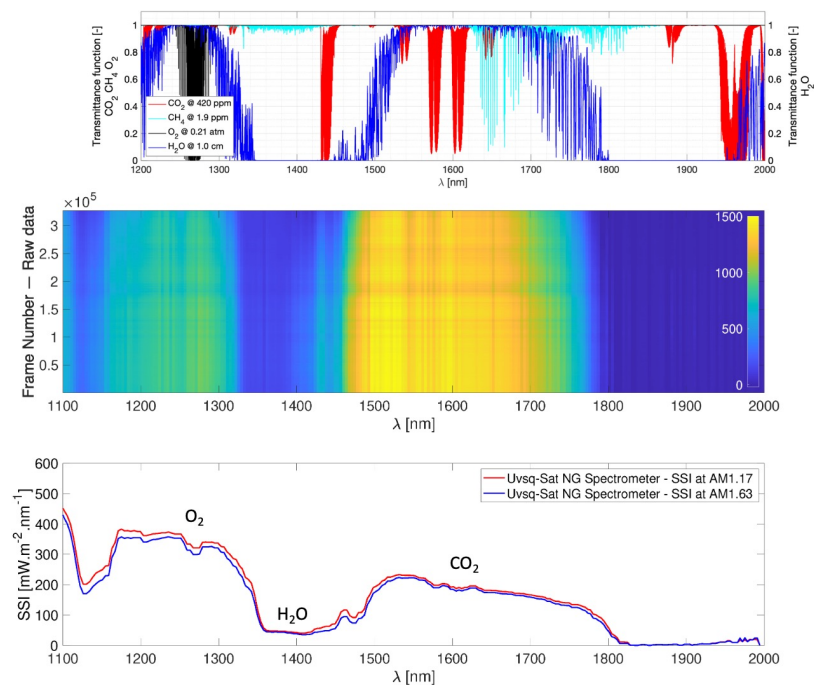
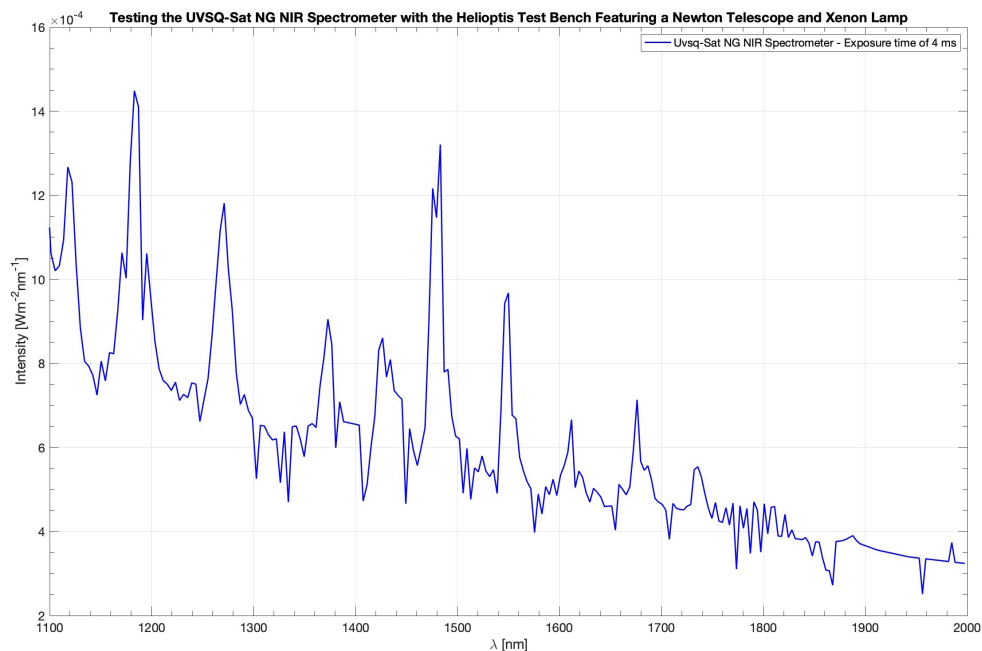
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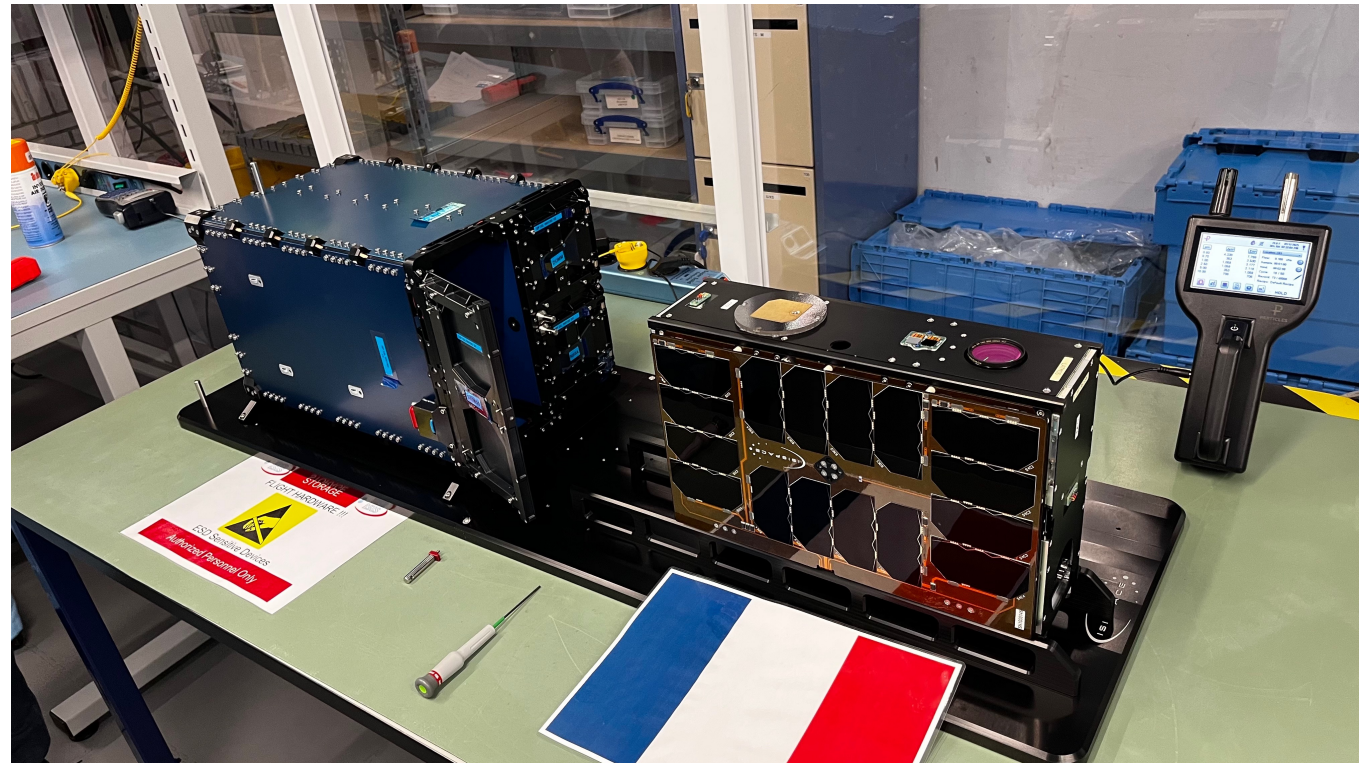
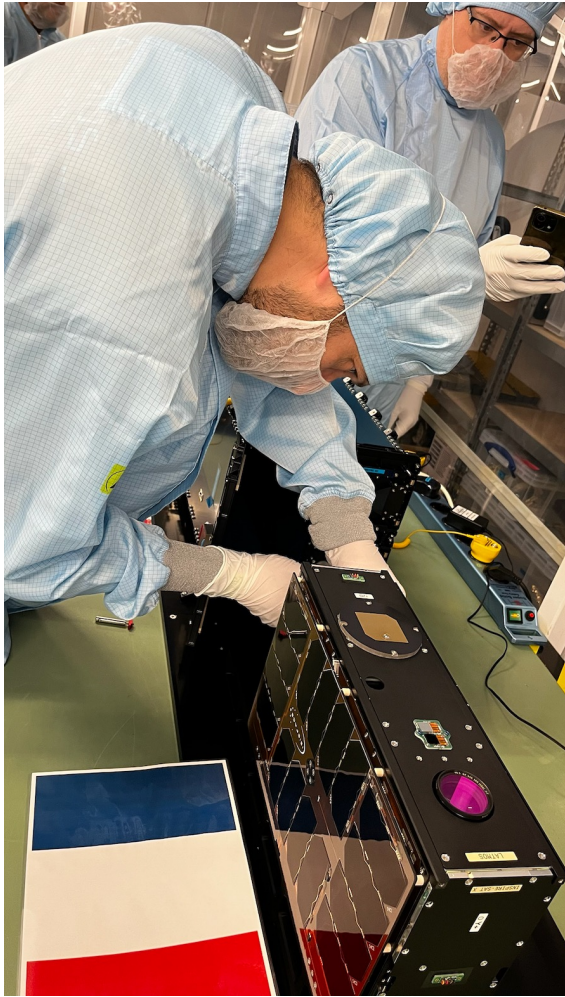
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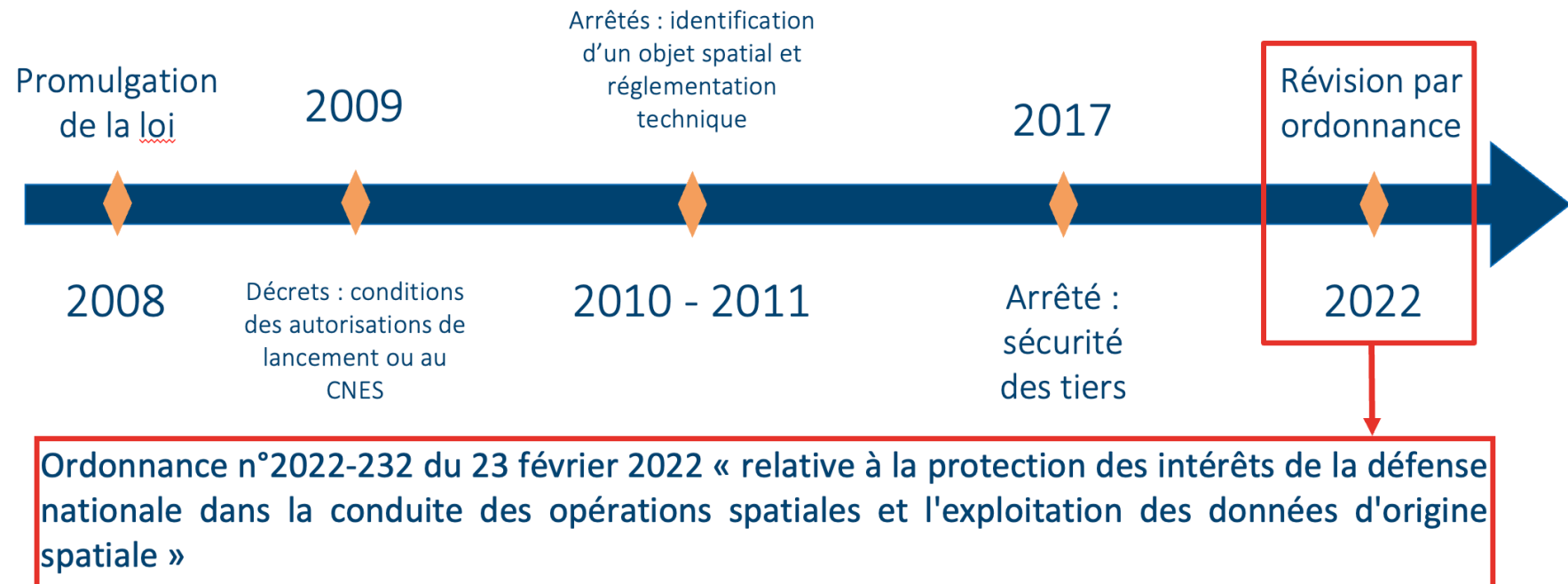
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INTERNATIONAL TELECOMMUNICATION UNION
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BUREAU DES RADIOCOMMUNICATIONS		RADIOCOMMUNICATIONS BUREAU		OFICINA DE RADIOCOMUNICACIONES		C-1.1.1.3	
RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATÉLITE		UVSQ-SAT-NG		SECTION SPÉCIALE N° SPECIAL SECTION No. SECCIÓN ESPECIAL N.º		API/A/13795	
				BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA		3033 / 29.10.2024	
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				NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN		124545198	
RENSEIGNEMENTS REÇUS PAR LE BUREAU LE / INFORMATION RECEIVED BY THE BUREAU ON / INFORMACIÓN RECIBIDA POR LA OFICINA EL						21.06.2024	

Ces renseignements reçus par le Bureau des radiocommunications, en application du numéro 9.1/9.2 du Règlement des radiocommunications, sont publiés conformément au numéro 9.2B.

This information, received by the Radiocommunication Bureau pursuant to No.9.1/9.2 of the Radio Regulations, is published in accordance with No. 9.2B.

Esta información, recibida por la Oficina de Radiocomunicaciones con arreglo al número 9.1/9.2 del Reglamento de Radiocomunicaciones, se publica de acuerdo con lo dispuesto en el número 9.2B.

Une administration qui estime que des brouillages inacceptables risquent d'être causés à ses réseaux ou à ses systèmes à satellites existants ou en projet communique à l'administration qui a demandé la publication des renseignements ses observations, avec copie au Bureau des radiocommunications, dans le délai indiqué ci-après.

Any administration which believes that unacceptable interference may be caused to its existing or planned satellite networks or systems shall communicate its comments to the publishing administration, with a copy to the Radiocommunication Bureau, by the deadline indicated below.

Cualquier administración que estime que se podría causar interferencia perjudicial a sus redes o sistemas de satélites existentes o planificados deberá comunicar sus comentarios a la administración que publica, con copia a la Oficina de Radiocomunicaciones, en el plazo que se indica más abajo.

DATE LIMITE POUR LA RÉCEPTION DES COMMENTAIRES
EXPIRY DATE FOR THE RECEIPT OF COMMENTS
FECHA LÍMITE PARA LA RECEPCIÓN DE LOS COMENTARIOS

28.02.2025

Uvsq-Sat NG a satellite for observing Earth

RÉPUBLIQUE FRANÇAISE

Ministère chargé de l'Enseignement supérieur
et de la recherche

ARRÊTÉ du 26 FEV. 2025

modifiant l'arrêté du 22 janvier 2025 portant autorisation à l'Université de Versailles Saint-Quentin-en-Yvelines – Laboratoire atmosphères, milieux, observations spatiales (UVSQ-LATMOS) pour faire procéder au lancement par la société SpaceX depuis les États-Unis d'Amérique et assurer la mise en œuvre de l'opération de maîtrise dans l'espace extra-atmosphérique du satellite UVSQ-SAT NG

Le Ministre auprès du Ministre d'État, Ministre de l'éducation nationale, de l'enseignement supérieur et de la recherche, chargé de l'enseignement supérieur et de la recherche et le Ministre auprès du Ministre de l'économie, des finances et de la souveraineté industrielle et numérique, chargé de l'industrie et de l'énergie,

Vu la loi n°2008-518 du 3 juin 2008 modifiée relative aux opérations spatiales ;

Vu le décret n°2009-643 du 9 juin 2009 modifié relatif aux autorisations délivrées en application de la loi n°2008-518 du 3 juin 2008 relative aux opérations spatiales ;

Vu l'arrêté du 31 mars 2011 modifié relatif à la réglementation technique en application du décret n°2009-643 du 9 juin 2009 relatif aux autorisations délivrées en application de la loi n°2008-518 du 3 juin 2008 relative aux opérations spatiales ;

Vu l'arrêté du 22 janvier 2025 portant autorisation à l'Université Versailles Saint-Quentin-en-Yvelines – Laboratoire atmosphères, milieux, observations spatiales (UVSQ-LATMOS) pour faire procéder au lancement par la société SpaceX depuis les États-Unis d'Amérique et assurer la mise en œuvre de l'opération de maîtrise dans l'espace extra-atmosphérique du satellite UVSQ-SAT NG ;

Vu la demande d'autorisation déposée par l'UVSQ-LATMOS enregistrée le 20 novembre 2024 ;

Vu l'avis du Président du Centre national d'études spatiales (CNES) par intérim en date du 14 janvier 2025 ;

Vu l'avis du Ministre des Armées en date du 17 janvier 2025,

Uvsq-Sat NG
Date du lancement : 8 Mars 2025

Fusée : Falcon 9 B5
Mission : Transporter 13
Lieu : Vandenberg (USA)
Orbite : 600 km

Inscription Suivi du Lancement - 11 Boulevard D'Alembert, 78280 Guyancourt
<https://www.uvsq.fr/lancement-imminent-duvsq-sat-ng>