Status of CNES programme on GHG

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MICROCARB for Global observations of atmospheric CO$_2$

A small (<80kg) & innovative instrument in Space in 2024/25

A high précision of 1 ppm (> 0.2%) on XCO$_2$

- The instrument is now integrated on the PF and is under the final Thermal Vacuum tests
- Satellite qualification review by December 2023
- Ready to fly from March 2024
- Discussion ongoing for the launch due to failure in VEGA-C initial plan
- Next performance Budget early 2024
MERLIN for global observations of atmospheric CH4

- French-German Scientific meetings to address processing and validation (and spectroscopy)
- CNES integration of the PF was successfully done in 2023
- DLR integration of the laser is ongoing and FM delivery expected in 2024
- Integration of the satellite expected to start in 2024/25 for a launch in 2028

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<th>Year</th>
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<tr>
<td>Phase</td>
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<td>Launch</td>
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<td>French system, ground segment and satellite developments</td>
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Newspace : GESat constellation by ABSOLUTE SENSING

- Selected as a Copernicus Contributing Mission (CCM) in June 2023
- Selected by French government for Space Investment programme

Fizeau Fourier Alontrack Spectro Imager (FFASI) instrument test campaign status

**Instrumental concept validation**
- Ground demonstration
- Outdoor controlled release tests and environmental test of the integrated sensor have been realized at Absolut facilities in Grenoble and at CNES facilities in Toulouse.

**SENSOR CHARACTERIZATION**
Absolut Sensing has characterized all sensor performance variables
(quantum efficiency, pixel response, non-linearity, noise characterization) on 6 models (4 engineering models, 2 flight models).

**LAB DATA PRODUCTION**
Absolut Sensing performed a technical validation of the methane measurement system in a laboratory environment, in order to study the acquisition and processing chain.

2 laboratory experiments have been conducted:
- a) Uniform scene one with a white light source and methane gas cell and no scanning performed by the instrument
- b) Textured scene one with one LED illuminating a printed textured scene through a methane cell. Scanning was performed by the instrument.

**Components tested**
- SWIR sensors
- Interferometric plate
- SWIR bandpass filter

**Q2 2023**
- PHASE 1 (CH4 Tech Demo)
  - 2024
  - 1 satellite

**Q3 2023**
- PHASE 2 (CH4 constellation)
  - 2025
  - 12 satellites

**Q4 2023**
- PHASE 3 (CO2 + N2O constellation)
  - 2026
  - 24 satellites
  - 2027