
High-spatial resolution imaging spectroscopy: past achievements and future CNES roadmap

Camille Desjardins^{*1}, Antoine Flipo¹, Damien Rodat¹, Laurie Pistre¹, Laure Oudda¹,
and Thierry Carlier¹

¹CNES – Centre National d’Etudes Spatiales - CNES (Toulouse, France) – France

Résumé

For the last fifteen years, the French Space Agency (CNES) has been actively involved in various studies on hyperspectral spatial missions, driven by the national scientific and defense communities. Through this presentation, the ongoing efforts to push further the imaging spectroscopy technologies will be shared with the national scientific community. The roadmap for future developments in the field will be outlined.

The hyperspectral mission, presented at the last SFPT-GH conference, was stopped at the end of 2023 due to the reallocation of the defense budget to other priorities. Despite this, CNES expresses its desire to continue working in the hyperspectral domain, proposing a roadmap to support ongoing national New Space hyperspectral missions, to extend and secure innovative hyperspectral technologies, and to assess the end-to-end performances of a filter-based instrument concept.

This roadmap targets a high-performance hyperspectral instrument with a ground sampling distance below 10 m over a 10 km swath, as required by the scientific community. Stress will be put on the critical components preparation, with selection and maturation of miniaturized components: SWIR detectors, filters, cryocoolers, and dedicated electronics. This effort will be structured around the design of innovative instrument breadboards, accurately characterized and able to acquire real data so that downstream processing techniques can be developed.

These studies are led to mitigate technical risks and validate the overall system performance with airborne acquisitions. Going from individual components up to data acquisitions enables a complete evaluation of the end-to-end performances and an accurate design of the processing techniques... contributing to get high resolution spectroscopy imagery closer to in-orbit deployment.

^{*}Intervenant