



HYPXIM: an innovative hyperspectral satellite for science, security and defence

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We provide a broad overview of hyperspectral applications and data requirements gathered by an ad-hoc group of some twenty French scientists and defence users. This group known by as GSH (Groupe de Synthèse sur l'Hyperspectral) has addressed clear and detailed technical requirements for a high spatial resolution hyperspectral mission on the following themes: study of vegetation, coastal and inland water ecosystems, urban environment, atmospheric studies, and more widely, geosciences and security –defence matters. The synthesis of these requirements helped substantially to set up consolidated space-based system requirements (i.e. mission requirements) in terms of spectral domain, spectral resolution, signal-to-noise ratio, spatial resolution, swath and revisiting period, which revealed the main key drivers for the design of a very innovative hyperspectral space system.

During the phase 0, CNES with the support of industry (Astrium et Thales Alenia Space) has compared two different scenario. The first one, named HYPXIM-C (HYPXIM-Challenging), aimed to finding out the highest possible resolution level (15m) achievable using a microsatellite platform, whereas the second scenario, called HYPXIM-P (HYPXIM-Performance), aimed to reach a higher spatial resolution (8m) and to provide a TIR hyperspectral capability.

Recently, the HYPXIM phase A has been decided and it focuses on the most performing concept, however without TIR capabilities. The challenge for the selected HYPXIM mission is to design a high resolution spectromager on an agile mini-satellite, at a reasonable cost. We will present the wide field HYPXIM core mission performance objectives, as well as the orbital parameters and mission scenarios.