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SUITS/SWUSV: a Solar-Terrestrial Space Weather & Climate Mission

Luc Damé and Alain Hauchecorne

Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), IPSL/CNRS/UVSQ, Guyancourt, France (luc.dame@latmos.ipsl.fr)

The SUITS/SWUSV (Solar Ultraviolet Influence on Troposphere/Stratosphere, a Space Weather & Ultraviolet Solar Variability mission) microsatellite mission is developed on one hand to determine the origins of the Sun's activity, understand the flaring process (high energy flare characterization) and onset (forecasting) of Coronal Mass Ejections (CMEs) and, on the other hand, to determine the dynamics and coupling of Earth's atmosphere and its response to solar variability (in particular UV) and terrestrial inputs. It therefore includes the prediction and detection of major eruptions and CMEs (Lyman-Alpha and Herzberg continuum imaging 200–220 nm), the solar forcing on the climate through radiation, and their interactions with the local stratosphere (UV spectral irradiance 170–400 nm and ozone measurements). SUITS/SWUSV includes a 8 instruments model payload with, in particular for Space Weather and Climate, SUAVE (Solar Ultraviolet Advanced Variability Experiment), an optimized telescope for FUV (Lyman-Alpha) and MUV (Herzberg continuum) imaging (sources of variability), SOLSIM (Solar Spectral Irradiance Monitor), a spectrometer with 0.65 nm spectral resolution from 170 to 340 nm, SUPR (Solar Ultraviolet Passband Radiometers), with UV filter radiometers at Lyman-Alpha, Herzberg, MgII, CN bandhead and UV bands coverage up to 400 nm, and ERBO (Earth Radiative Budget and Ozone), NADIR oriented to measure ozone (6 bands) and 0.1-100 μm ERB. Example of accommodation of the payload has been performed on a new PROBA type platform very nicely by Qinetic. Heritage is important both for instruments and platform leading to high TRL levels. SUITS/SWUSV is designed in view of ESA Small Mission Calls and other possible CNES/NASA opportunities in the near future (Heliophysics, Earth Observation, etc.).