

The SoSWEET-SOUP (SOlar, Space Weather Extreme Events and Stratospheric Ozone Ultimate Profiles) Constellation Mission

Luc Damé [Luc.Dame@latmos.ipsl.fr]¹, M. Meftah¹, A. Hauchecorne¹, S. Bekki¹, P. Keckhut¹, A. Sarkissian¹, M. Marchand¹, R. Thiéblemont², J.-P. Duvel³, D. Bolsée⁴, N. Pereira⁴, G. Cessateur⁴, et al.⁵

¹ Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), IPSL/CNRS/UVSQ, Guyancourt, France

² LPC2E, Orléans, France

³ École Normale Supérieure - Laboratoire de Météorologie Dynamique (ENS-LMD), Paris, France

⁴ BIRA-IASB, Brussels, Belgium

⁵ PMOD/WRC; CAU University of Kiel; University of Athens; CU/LASP; NASA Goddard; NCAR/HAO; KASI South Korea, Indian Institute of Astrophysics Bangalore, ...

SoSWEET-SOUP is an innovative small satellites constellation which aims to measure on complementary platforms the solar influence on climate and the Earth radiation budget, with a particular focus on UV spectrum and ozone layer, which are most sensitive to solar variability. Another major scientific and operational objective is Space Weather extreme events detection in Lyman Alpha, 3 orders of magnitude more sensitive than H Alpha and with high resolution and contrast (> to He II 304). Previsions are possible hours in advance (flux rope deformation). The mission combine the scientific advantages of associating a constellation of 12 nanosatellites (20-30 kg, 12 to 24 "U") on equatorial orbits (+/- 20°) to a small polar satellite of 100-120 kg on a OneWeb Arrow like platform for an almost continuous solar viewing (including arctic and antarctic regions).

SoSWEET-SOUP model payload definition is still open but will include, on the polar satellite, SUAVE (*Solar Ultraviolet Advanced Variability Experiment*), an optimized heavy-duty thermally stable SiC telescope for FUV (Lyman-Alpha) and MUV (200–220 nm) imaging (sources of variability, extreme events), and SOLSIM (*SOLar Spectral Irradiance Monitor*), a newly designed UV double-monochromator covering 170-340 nm with 0.65 nm resolution. Other instruments may include another SSI instrument (C-SIM or C-SOL declination for absolute intercalibrations), a small coronagraph, new UVC detectors (for Herzberg continuum), ozone radiometers, Earth radiative budget, Electron-Proton detectors and vector magnetometer. Constellation satellites include: precise ozone profiles (miniGOMOS with dual Sun and stars occultations), temperature and detailed energy radiative budget monitors (miniSCARAB evolved type). Science objectives, mission profiles and payload (insisting on SSI) will be presented and opportunities of missions and potential collaborations discussed.