

New Solar Reference Spectrum SOLAR-ISS and Variability from SOLAR/SOLSPEC – Nine Years of Observations of Solar Cycle 24

Luc Damé¹ [luc.dame@latmos.ipsl.fr], **Mustapha Meftah**¹, **Alain Hauchecorne**¹, **Slimane Bekki**¹, **Abdanour Irbah**¹, **David Bolsée**², **Nuno Pereira**², **Dominique Sluse**², and **Gaël Cessateur**²

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

² *Belgian Institute for Space Aeronomy (BIRA-IASB), Brussels, Belgium*

For 9 years since April 5, 2008 and until February 15, 2017, the SOLSPEC (SOLar SPECTrometer) spectroradiometer of the SOLAR facility on the International Space Station (ISS) performed accurate measurements of Solar Spectral Irradiance (SSI) from the far ultraviolet to the infrared (165 nm to 3000 nm). These measurements, unique by their large spectral coverage and long-time range, are of primary importance for a better understanding of solar physics and of the impact of solar variability on climate (via Earth's atmospheric photochemistry), noticeably through the "top-down" mechanism amplifying ultraviolet solar forcing effects on the climate (UV affects stratospheric dynamics and temperatures, altering interplanetary waves and weather patterns both poleward and downward to the lower stratosphere and troposphere regions). SOLAR/SOLSPEC, with almost 9 years of observations covering the essential of the unusual solar cycle 24, followed UV temporal variability and established a new reference solar spectra from UV to IR (165-3000 nm). A complete reanalysis of data was possible thanks to revised engineering corrections, improved calibrations and advanced procedures to account for thermal influence, aging (degradation) and pointing corrections. These intensive ground and space calibrations allowed a proper evaluation of uncertainties on these measurements. Results, the new absolute reference spectrum (SOLAR-ISS) and UV variability, are presented and compared with other measurements (WHI, ATLAS-3, SCIAMACHY, SORCE/SOLSTICE, SORCE/SIM) and models (SATIRE-S, NRLSSI2).