

Working Group 1 Research Activities Report

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ABSTRACT

The main purpose of this report is to summarize the research activities and future plans of the Solar Electromagnetic Radiation Study for Solar Cycle 22 (SOLERS22) Working Group 1 (total irradiance, near-UV, visible and infrared spectral bands). The initial interest of WG1 within the SOLERS22 program is to (1) monitor solar total, near-UV, visible, and infrared irradiances, (2) compare the irradiance values to spatially resolved data to better understand the underlying physical mechanisms of irradiance variability, (3) theoretical interpretation of irradiance variations, and (4) development of long-term irradiance models to clarify the role of solar variability in climate changes. Considerable research efforts have been made within the last few years to achieve the original goals of WG1. Total solar irradiance has been observed by the ACRIM 11 radiometer on board the UARS satellite and additional data were provided by the EURECA SOVA1 and SOVA2 instruments between August 10, 1992 and July 1, 1993. The EURECA experiment also monitored solar irradiance in near-UV, visible and IR. In parallel with these space observations, ground-based measurements (in Cal K-line, at H α - 1083 nm, white-light) are taken on a regular basis at the National Solar Observatory at Sacramento Peak and Kitt Peak; at the San Fernando Observatory, California State University; at the Big Bear Solar Observatory; and at the Institute of Astrophysics at Tenerife, Spain. One of the major future plans of WG1 is to analyze the SOHO/VIRGO total solar and spectral irradiance data in comparison with the high resolution images to be taken by the VIRGO/101 and SOI/MDI. Research on the YOHKOH white-light images is also one of the main plans.