

**Projection of SORCE Total Solar Irradiance Measurements 5-10 Days Forward For Near Real-Time Applications**

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Total solar irradiance (TSI) measurements from NASA's Solar Radiation and Climate Experiment (SORCE) are currently being used in processing satellite observations from the Clouds and the Earth's Radiant Energy System (CERES) instruments into climate-quality radiation budget parameters. The same satellite observations are used in a CERES sub-project named the Fast Longwave and Shortwave Radiative Fluxes (FLASHFlux) for producing near real-time TOA and surface radiation budget products within one week of satellite observations. Processing of FLASHFlux starts two days after satellite observations when those observations and coincident reanalysis products from GEOS become available. The 7-day latency of SORCE data creates the need for projecting TSI values at least five days forward.

Several numerical procedures were tried for accomplishing this projection. Use of the latest available daily measurement and averages over periods of 10, 30, and 90 days were examined on the basis of corresponding bias and random error of the projected value when compared with corresponding actual measurements. The year 1991 was chosen as an example because of the high solar activity and day-to-day variability. Comparisons showed that bias was lowest ( $0.27 \text{ Wm}^{-2}$ ) with the use of the latest-day measurement, increasing for 10- and 30-day averages and leveling off at  $0.51 \text{ Wm}^{-2}$  for the 90-day average. Random error was highest ( $0.99 \text{ Wm}^{-2}$ ) for the latest-day measurement and decreased to  $0.79 \text{ Wm}^{-2}$  for the 90-day average. Corresponding results for a quiet year (2009) showed much lower biases and random errors. Results for 7- and 10-day projections will also be presented.