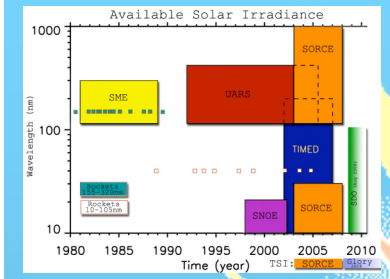
The LASP Interactive Solar IRradiance Datacenter (LISIRD)

M Snow, T N Woods, F G Eparvier, J Fontenla, J Harder, W E McClintock,
C Pankratz, E Richard, A Windnagel, D Woodraska

LASP LABORATORY FOR ATMOSPHERIC AND SPACE PHYSICS
UNIVERSITY OF COLORADO AT BOULDER



The University of Colorado's Laboratory for Atmospheric and Space Physics (LASP) has been measuring the solar irradiance for almost 25 years. The chart at left shows the time and wavelength coverage for the various missions. We are now ready to make these datasets available through a common interface with the LASP Interactive Solar IRradiance Datacenter (LISIRD).

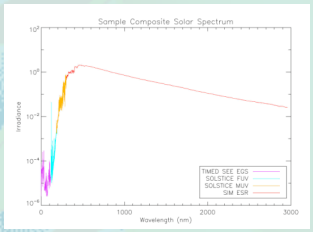
http://lasp.colorado.edu/lisird

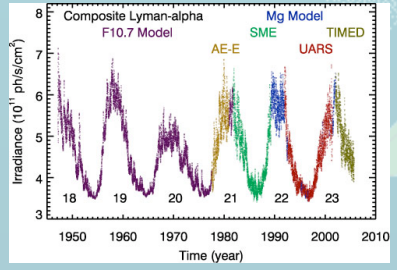
LISIRD will simplify access to the data through a common user-friendly interface, and will increase the usefulness of the individual datasets by merging in time and wavelength to produce the irradiance data the user wants.

LASP Interactive Solar IRradiance Datacenter

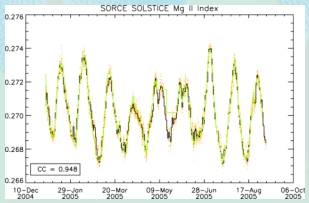
Composite Spectra and Time Series

No single instrument can measure the solar spectral irradiance from X-rays to the IR, but the ensemble of LASP instruments can. The daily spectrum from different instruments can be stitched together by LISIRD to give the user the solar irradiance over the desired wavelength range as a single data product, taking proper account of the changes in spectral resolution.





Composite time series will use the best available data, filling in gaps with either data from other instruments or model results. A Lyman alpha (121 nm) time series is shown here which extends from the current time back to 1947 using a proxy model to fill in for missing measurements.

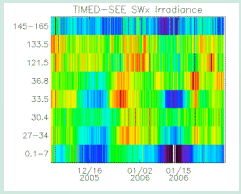


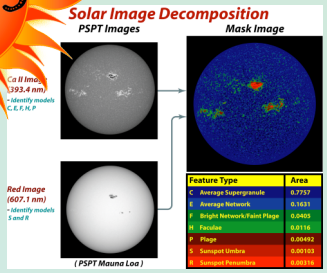
Space Weather Data

There is a growing need for near real-time data, and LISIRD will provide users with SORCE and TIMED-SEE data with a minimum latency.

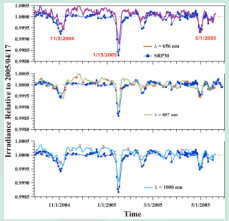
Space Weather Measurements:
- TSI
- Lyman Alpha (121.6 nm)
- Magnesium II Index
- He II (30.4 nm)
- Fe XVI (33.5 nm)
- FUV Continuum (145-165 nm)

Every 12 hours, the system checks for new data from the various spacecraft and then uploads the appropriate data products to the ftp server. Remote users can automatically download this new data for space weather or other applications.

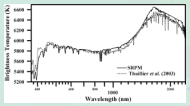


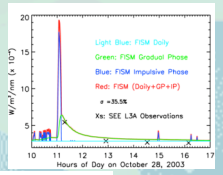


The synthetic solar spectrum produced by the Solar Radiation Physical Model (SRPM) of Fontenla et al. results will be available for download. This model uses daily images from the PSPT to determine the absolute contributions to the spectral irradiance at all visible and IR wavelengths from the various features (plage, sunspots, penumbra, etc.). These image masks will also be available for reference.

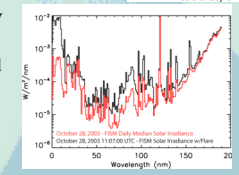


Synthetic Spectra





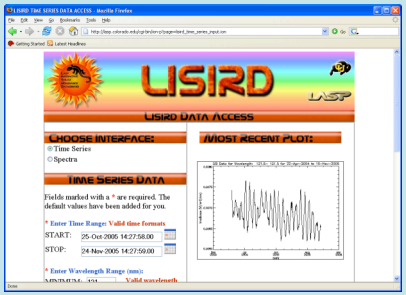
The synthetic solar spectrum produced by the Flare Irradiance Spectral Model (FISM) of Chamberlin will also be available. This model reproduces the EUV and FUV spectrum of the Sun on one-minute time cadence to model the effects of flares on the solar irradiance.



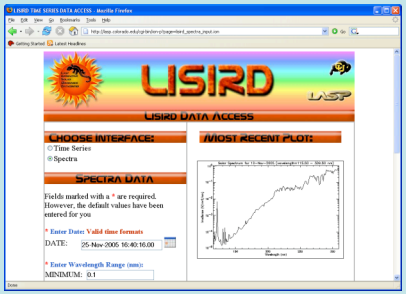
Web Interface

Available Solar Irradiance Measurments		
Spectral Region	**Wavelength (nm)**	**Measurments From**
Soft X-ray (XUV)	0.1-30	SNOE, TIMED, & SORCE
Extreme Ultraviolet (EUV)	30-115	TIMED
Far Ultraviolet (FUV)	115-200	SME, UARS, TIMED, & SORCE
Middle Ultraviolet (MUV)	200-300	SME, UARS, & SORCE
Near Ultraviolet (NUV)	300-400	UARS & SORCE
Visible (VIS)	400-750	SORCE
Near Infrared (NIR)	750-2700	SORCE
TSI		SORCE

The catalog of available datasets is shown in both graphical and tabular format. In either form, the user can click on a dataset name to learn more about the time, wavelength range, and spectral resolution for any given dataset.



In time series mode, the user selects a time range and a wavelength interval. The system can plot a preview of the data and produce a file for download. If the time range spans more than one mission, then the datasets are automatically merged.



In spectrum mode, the user selects a wavelength interval and spectral resolution. The system gets the data from the various instruments and convolves it with the appropriate kernel.