LISIRD: An Online Resource for Making Solar Data More Accessible

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Abstract

Finding quality solar data can be difficult, if not cumbersome at best, especially for students and early career researchers. The trend of having static files in an obscure format served in a hidden directory on some seemingly random server certainly doesn't help the situation, not to mention the datasets that are only accessible via a researcher's hard drive. The LASP Interactive Solar IRradiance Datacenter (LISIRD), lasp.colorado.edu/lisird, seeks to alleviate many of these pains. LISIRD is a website where students and researchers can discover, visualize, and download solar data from a variety of space missions, instruments, models, and laboratories. LISIRD focuses on making heliophysics research as effortless as possible by making solar data openly available and easy to analyze through an intuitive user interface, detailed metadata, interactive plotting capabilities, and a catalog of over 75 datasets. This poster will demonstrate the key features of LISIRD, provide details on the datasets it serves, outline future plans for improvement and growth, and discuss how it can be used as a valuable resource in space physics curricula.

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Overview

The LASP Interactive Solar IRradiance Datacenter (LISIRD) is a website that provides convenient, standardized access to solar data from a variety of space missions, instruments, models, and laboratories. LISIRD provides several types of data, including solar spectral irradiance, total solar irradiance, spectral bands, sunspot number, and composite.

The primary objectives of LISIRD include:

- **Discoverability**: Make solar data more openly available.
- **Standardization**: Offer a common interface for otherwise disparate data.
- **Modernization**: Rethink how data can be accessed beyond just static files on a server.
- **Analyzability**: Offer data that is analysis ready by removing preprocessing overhead.

Improvements

The LASP web team is in the process of upgrading LISIRD. By the summer of 2020, you can expect several new features, including:

- Image datasets made available through an interactive image viewer.
- Better integration with tools like Python, Jupyter Notebooks, and SunPy.
- Easier comparative analysis by displaying multiple datasets on the same plot or page.
- The ability to save and share specific configurations of plots and groups of plots.

Contact Us

lisird@lasp.colorado.edu

Feel free to contact us with any questions, feedback, or suggestions for datasets you'd like offered through LISIRD.

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Over 75 Solar Datasets From LASP, NASA, NOAA, NSO, and more!

Discover

HIDE FILTERS

100000 nm

RESET ALL FILTERS

WAVELENGTH

LASP Interactive Solar Irradiance Data Center Velcome to the LASP Interactive Solar Irradiance Data Center! LISIRD provides a simple web interface for the plotting of and access to a number of solar datasets (solar spectr Search DATE RANGE 1610-01-01 2019-12-03

All Datasets 78						^
Dataset Name 🛧	Start Date	End Date	Data Type(s)	Cadence	Wavelengths (nm)	Info
American Relative Sunspot Number - Daily	1945-01-01	2019-12-03	Sunspot Number	24hr		0
American Relative Sunspot Number - Monthly Averages	1944-12-01	2019-12-03	Sunspot Number	30 Days		0
Bremen Composite Magnesium II Index	1978-11-07	2019-12-03	Composite Spectral Bands	24hr		0
CA II K-Line	1976-11-20	2015-10-01	Composite	24hr		0
Composite Magnesium II Core-to-Wing Index	1978-11-06	2013-07-15	Composite Spectral Bands	24hr	280 - 280	0
Composite Solar Lyman-alpha	1947-02-14	2019-12-01	Composite Spectral Bands	24hr	121 - 122	0
Debrecen Photoheliographic Sunspot Data	1974-01-01	2017-01-01	Sunspot Number	24hr		0
DeLand Composite Solar Spectral Irradiance	1978-11-08	2005-08-01	Composite Solar Spectral Irradiance	24hr	120.5 - 399.5	0
EMPIRE Solar Spectral Irradiance	1947-02-14	2017-05-31	Solar Spectral Irradiance	24hr	115 - 160000	0
EMDIDE Total Salar Imadianas	1947-02-14	2017-05-21	Tatal Calar Incidence	24br		

Search and filter controls to help quickly find applicable datasets

e measurements are made by the LASP Total Irradiance Monitor (TIM) instr rd the SORCE spacecraft. TIM has been measuring total solar irradiance (T '2) since shortly after the SORCE launch in early 2003. This data set conta ges over 6 hour periods. The total solar irradiance (TSI) measurement mor ges in incident sunlight to the Earth's atmosphere. The TIM measures TSI f ated absolute accuracy of 350 ppm, 0.035%. Relative changes in solar irra leasured to less than 10 ppm/yr (0.001%/yr), allowing determination of post term variations in the Sun's output.	rument FSI, ains TSI hitors to an adiance ssible -data/	Details Version: 1 Cadence: Processin Time Rang	7 6hr g Level: 3 je: 2003-02-25	through 2019-11	-26			
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Calibration adjustments (cavity heater resistances corrected for varying temperatures; temperature coefficients of certain heater lead resistance changed; temperature weightings for heater lead resistances changed) improved thermal corrections due to large temperature fluctuations with ongoing orbital power cycling New dark model implemented for all cavities to better match existing d (thermal background) measurements Updates to instrument degradation using cavity inter-comparisons three.	SME Solar Irradiance SORCE M to-Wing In	r Spectral - Daily Average agnesium II Core- idex	1981-10-09 2003-02-27	1989-04-13 2019-12-03	 Solar Spectral Irradiance Spectral Bands 	24hr Orbit	115.5 - 302.5 280 - 280	0
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Detailed metadata

asp.colorado.edu/lisird

Visualize

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LISIRD				
DATA MISSIONS	TOOLS	ABOUT	and the same	
SORCE SOLAR SPECTRAL IRRADIANCE, TIME SERIES			1000	
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2004 2005 2006 2007 2008 2009 2010 201 mm/MMm/2008	LASP INTERACTIVE SOLAR IRRADIANCE DATACENTER	MISSIONS	T001S	ABOUT
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		800 1000 waw 1000	1200 1400 1600 1800 elength (nm) 1500	2000 2200 2400
	Parameter Zoom Mode Irradiance • X only •	Display Type Lines and Po	Y-axis ▼ Logarithmic ▼	Show Navigator
	SELECT VIEW: Time Series Spectrum	APPLY	SPECTRUM RANGE: Start End 0.1	2412 APPLY

Time series and spectrum views for SSI datasets



Intuitive plot interaction tools



Laboratory for Atmospheric and Space Physics University of Colorado **Boulder**



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DOWNLOAD API TOOLS

For more information about file formats or advanced options see the LaTiS about p

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Direct Download URL

4T17:00:00.000Z&time<=2015-09-

Data Download O Image Download Displayed Range (1976-11-14 - 2015-09-30) All Parameters File Format csv: Comma delimited ASCII with simple header. Advanced Options exclude_missing X format_time(yyyy-MM-dd)

ADVANCED OPTIO

Warning: Large data downloads may take a long time and your brows may crash if you attempt to open the data file in the browser DOWNLOAD

T18:00:00.000Z&exclude missing()&format time(yyyy-MM-dd)

//lasp.colorado.edu/lisird/latis/dap/cak.csv?&time>=1976-

Download customization options Great for keeping file sizes small by getting only the data you need

TEXT FORMATS

asc: ASCII representation reflecting how the dataset is modeled.

csv: Comma delimited ASCII output with simple header.

- tab: Tab delimited ASCII output with no header.
- txt: Comma delimited ASCII output with no header.

JSON TEXT FORMATS

ison: JSON output with labels

isona: JSON output as arrays

isond: JSON output with metadata and arrays of data.

BINARY FORMATS

bin: Binary stream of IEEE bytes.

png: Raster image.

svg: Scalable vector image, suitable for web pages.

nc: NetCDF output

pdf: Scalable vector image, suitable for printing.

Numerous download formats



