SM31B-03. The Virtual Solar Observatory at Two and a Half

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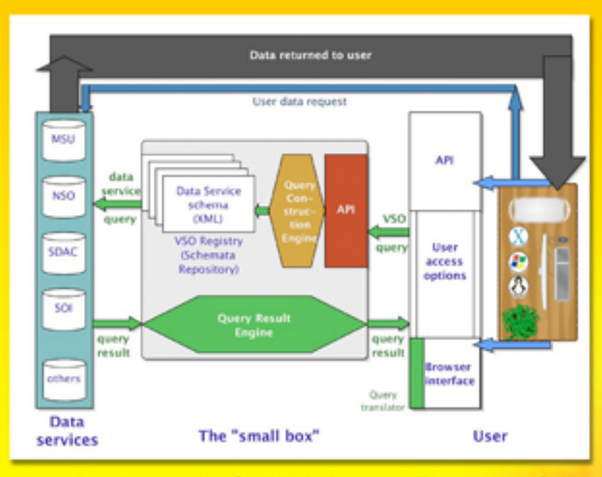
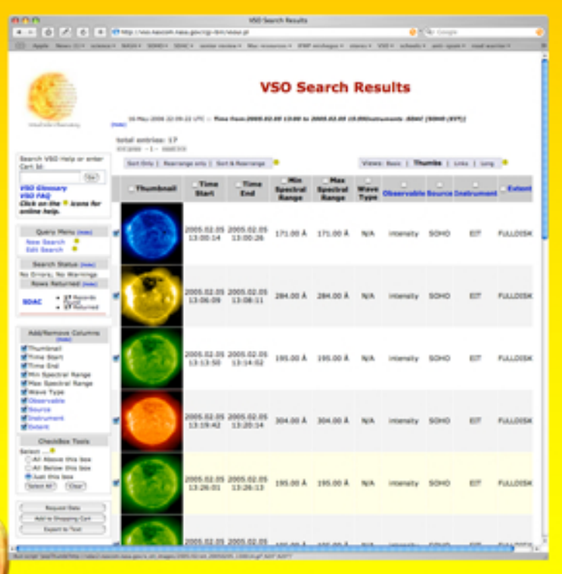
ABSTRACT. The Virtual Solar Observatory (VSO) has survived its infancy and provides metadata search and data identification for 26 data sets held at 12 online archives, as well as flare and coronal mass ejection (CME) event lists. Like any toddler, the VSO is good at getting into anything and everything, and is now extending its grasp to more data sets and providers, new missions, and new access methods using its application programming interface (API). We discuss recent changes, including developments for STEREO and SDO, and an IDL-callable interface for the VSO API. We urge the heliophysics community to help civilize this obstreperous youngster by providing input on ways to make the VSO even more useful for system science research.



Keeping it simple: the VSO design effort was tightly circumscribed, so the original design team of solar physicists and computer scientists realized the need to limit the design to the minimum necessary to do the job: provide distribyted access to metadata for queries, return the metadata to the user for query refinement, and provide access to the data at the data providers' sites. All of the VSO interfaces (green arrows) are based on XML and SOAP, or HTML. Thansk to feedback at regular scientific meetings, the design included an API as well as a Web interface.

A search starts simply enough: All VSO searches are based on a time range and some combination of other parameters (physcial observables, instrument, data provider, spectral range, or combinations of these known as "nicknames" (e.g. "EUV image," "vector magnetogram").

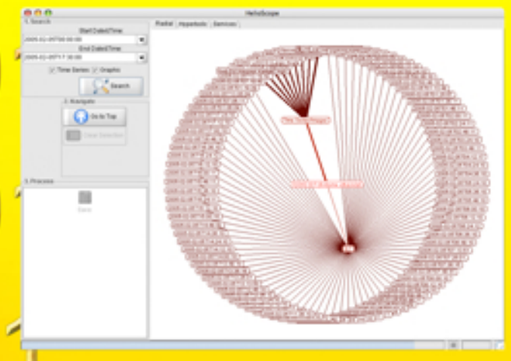
A partly exploded time/instrument search shows all providers and instruments for search: Currently, 12 providers offer a total of 25 different data sources. More are on the way. (A fully exploded version would show each instrument in each observatory.)



Search results can include thumbnails for image data: Thumbnails are often links to full-sized images. The Graphic User Interface (GUI) used the "shopping cart" idiom common to commercial Websites.

Data delivery: Depending on the provider, data can be delivered as a URL for each file or an e-mail message indiciating that a tarball is waiting for retrieval on an ftp server.

Alternate time specification: The time range(s) for a search can be determined by searching event catalogs. Currently, these include a coronal mass ejection (CME) catalog and two flare catalogs.



Using the VSO API: Users can design software to communicate with the VSO's Application Programming Interface (API). In this example from the UK's AstroGrid, the Java applet Helioscope searches the VSO for solar data and the CDAWeb for in situ data products. If the user clicks on a particular data type (here SOHO EIT), an exploded view of available files is displayed. Heliscope can be linked with the Aladin image viewer, although Aladin can not yet process raw images correctly.

API query and response: A simple query (left) for a single instrument's data in a given time range produces the response to the right.

IDL callable VSO: Using the VSO API and IDL™'s XML parsing capabilities, combined with IDL sockets, the VSO_SEARCH and VSO_GET functions allow an IDL user to query the VSO and download data matching user-defined metadata queries, if the files are served as URL's.

Signed up: SDO data from AIA, HMI, and EVE will be available *via* the VSO.

http://virtualsolar.org/