

# Constructing the Subaru Advanced Data and Analysis Service on VO

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• *National Astronomical Observatory of Japan*  
• *Astronomy Data Center*

# Contents

- **Subaru Telescope and Instruments**
- **Current Status of Subaru Data Archives**
  - STARS, MASTARS, **SMOKA**
- **On-going and planned improvement of Subaru Data Service**
  - Quality Assessment System (**NAQATA**)
  - **GRID** computing system
  - Subaru Data Service on **JVO**

# Related Papers

- **(P2.16) Development of Quality Assessment System for Subaru Data**  
**Fumiaki Nakata et al.**
- **(P3.05) New features of Subaru Telescope Science Archive System, SMOKA**  
**Motohiro Enoki et al.**

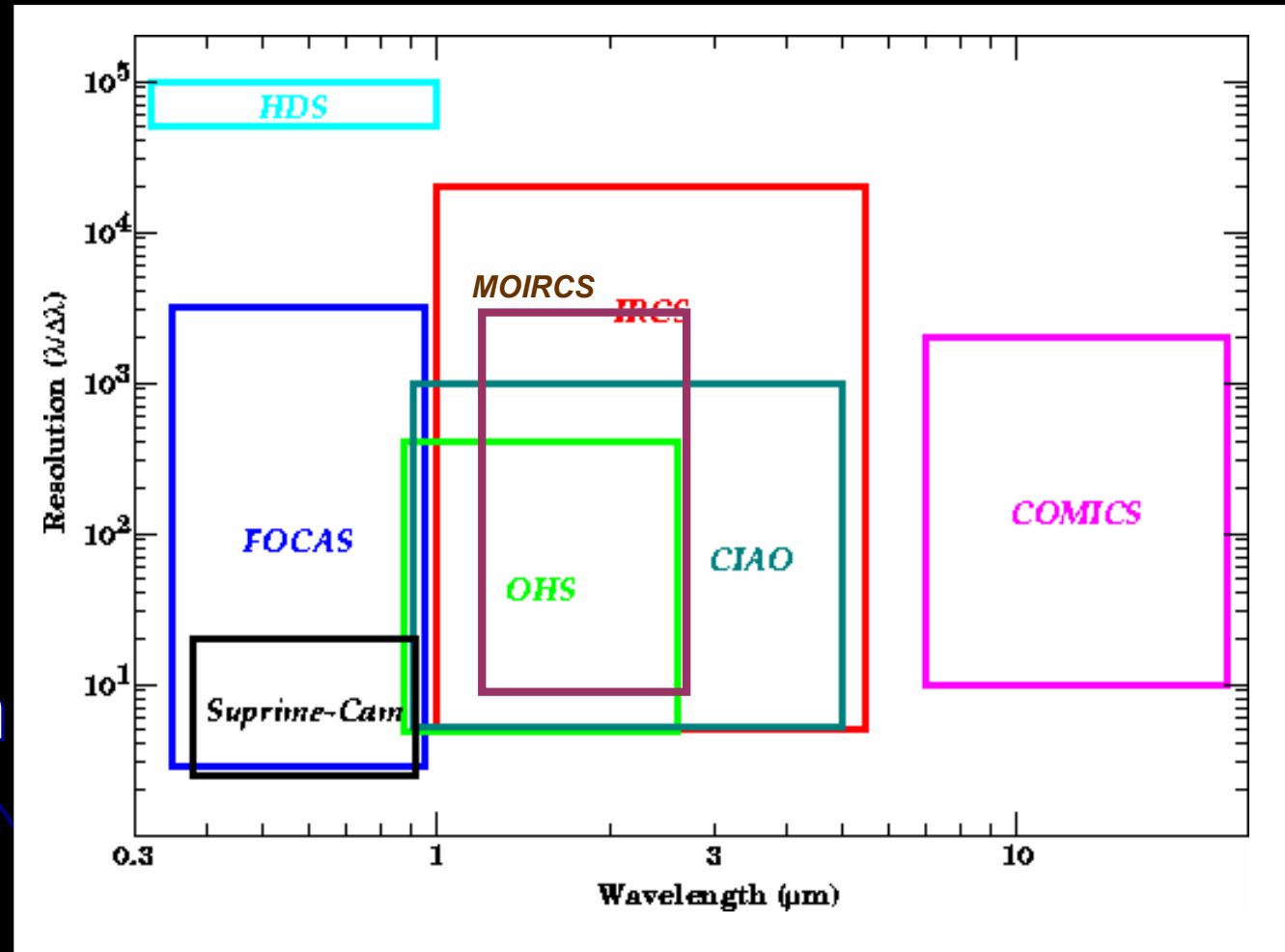
# Subaru Telescope

**Subaru**  
**Telescope** is  
an optical-  
infrared 8.2 m  
telescope at  
Hawaii,  
operated by  
**NAOJ**.

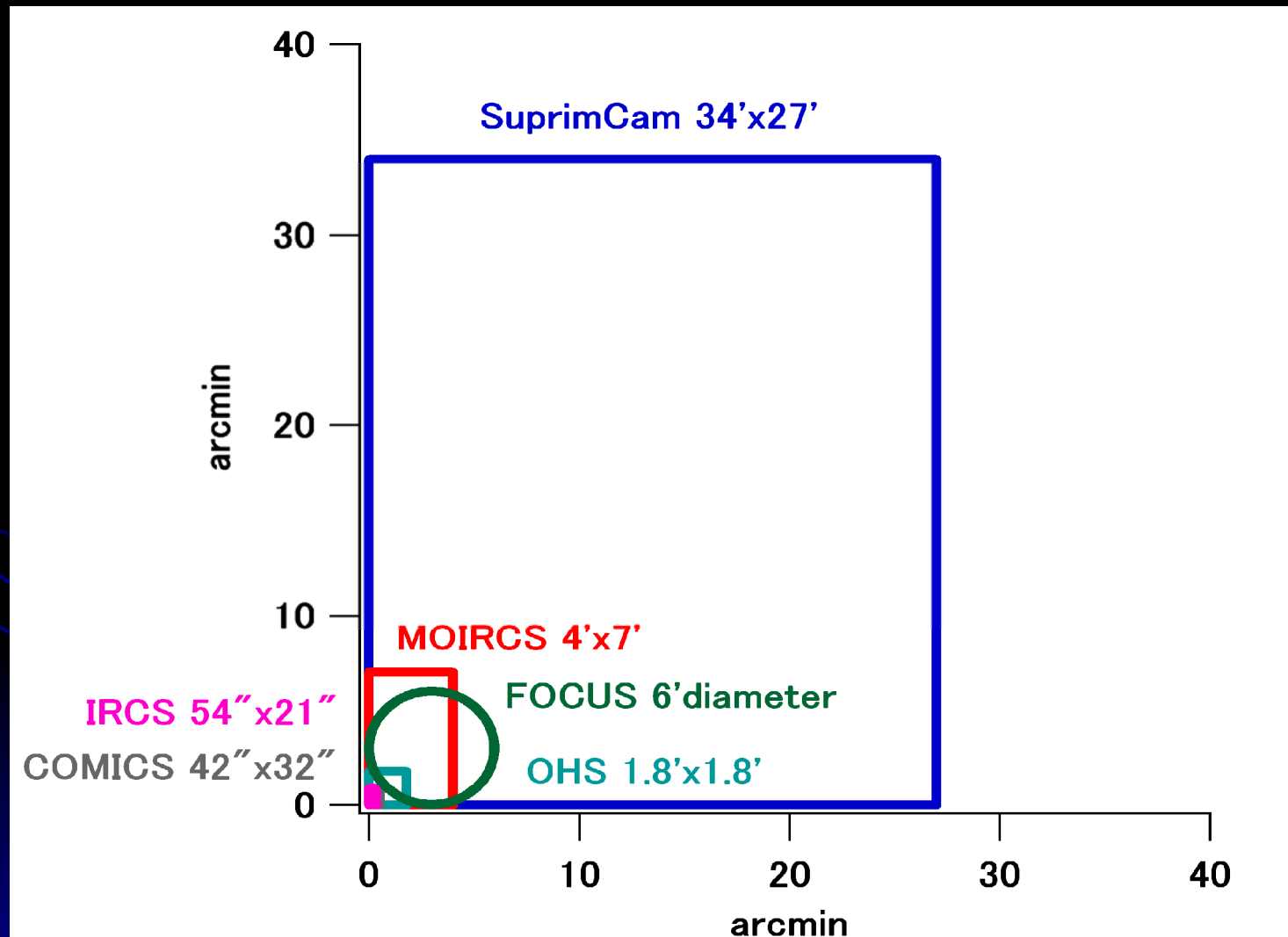


# Instruments for Subaru

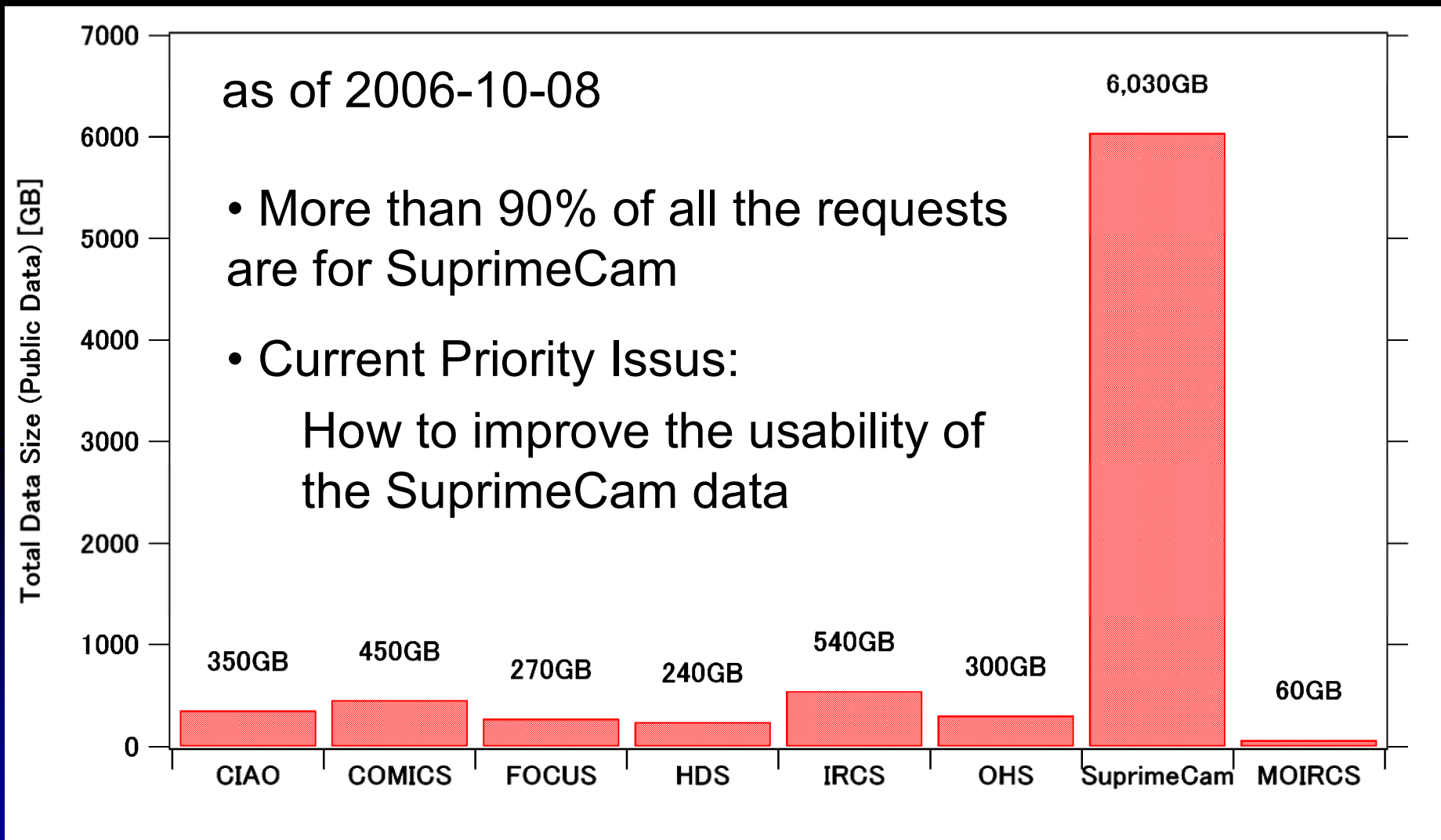
- CIAO
- ~~OHS/CISCO~~
- COMICS
- FOCUS
- IRCS
- **MOIRCS**
- SuprimeCam
- HDS
- AO/CIAO



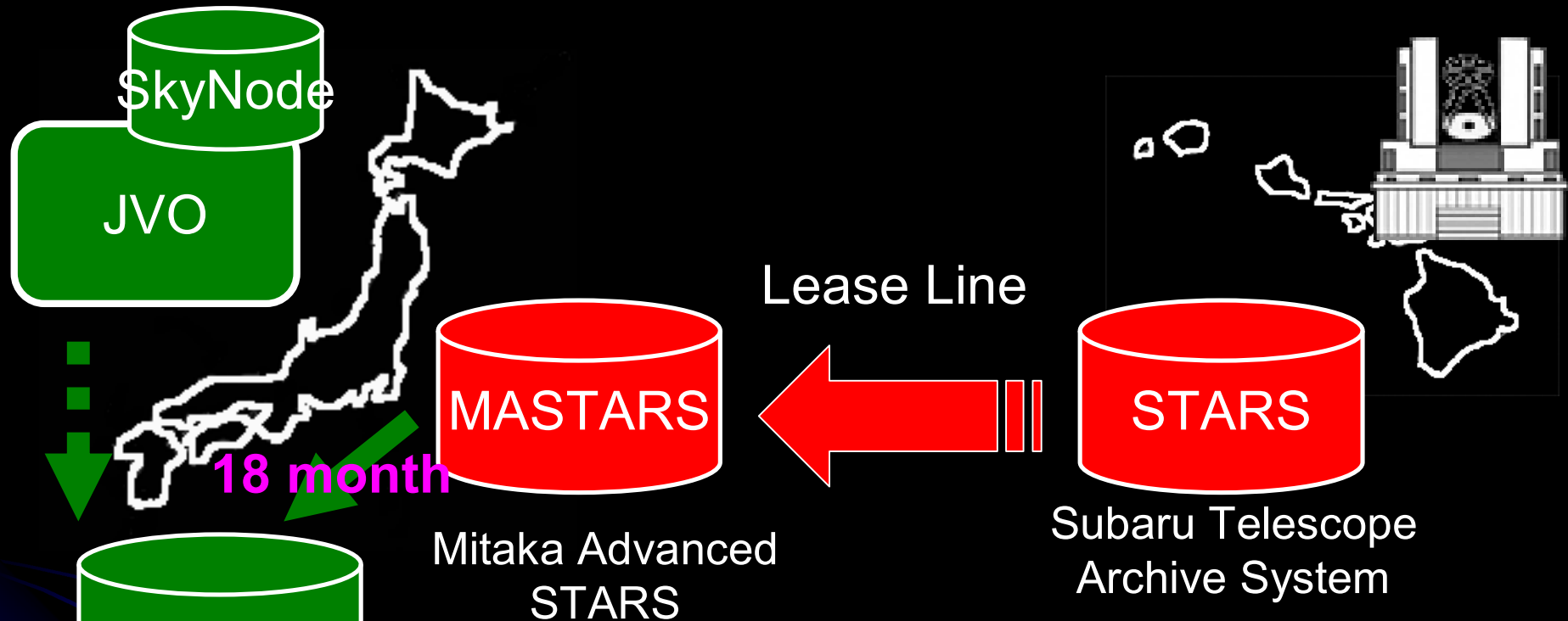
# Instruments' Field of View



# Total amount of public data



# Subaru Data Archive



Subaru Mitaka Okayama  
Kiso Archive

Poster 3.05  
by M. Enoki et al.

- STARS:** a sub-system of the Subaru Telescope, not public
- MASTARS:** a mirror of STARS
- SMOKA:** public archive system
- JVO:** Virtual Observatory Web Portal



# Astronomy Data Center of NAOJ

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Mitaka Advanced Subaru Telescope ARchive System - Mozilla Firefox

ファイル(E) 編集(E) 表示(V) 移動(G) ブックマーク(B) ツール(T) ヘルプ(H)



Mitaka Advanced Subaru Telescope ARchive System

Push "Search" button to start picking up frames.

<ProposalID\_InstrumentName>  
CIA\_OPENED

<Frame-ID Range>  
From  To

<Acquisition-Date Range>  
From 2004 Y 01 M 1 D To 2004 Y 12 M 30 D

Check "VGW DATA" check box if you also want VGW DATA  
 VGW DATA

Check "Calibration Data" check box if you also want other proposal-ID calibration data.  
 Calibration Data ( other proposal-ID )  
If not specified, search calibration data since 2006-08-10.  
From  Y  M  D To  Y  M  D

**Output Options**

Display query result  
 Send query result via e-mail

<https://stars.naoj.org/>  
<http://sb2002.sb.nao.ac.jp/>

- require a user account on the Subaru computer system
- science, calibration, and environment data
- data are copied to the user scratch area on Subaru computer system
- three query modes:
  - data transfer mode
  - detailed query mode
  - tape retrieval mode

# SMOKA ver 3.0

ver 3.0 : New search interfaces (SUP Search, All Keywords Search, Full-Text Search) are opened. New processed SuprimeCam COMQ data are available (2006/5/24).

SMOKA provides public science data obtained at Subaru Telescope, 188cm telescope at Okayama Astrophysical Observatory, and 105cm Schmidt telescope at Kiso Observatory (University of Tokyo). It is useful for astronomical researchers.

## Resources

[SMOKA Web Index](#)

[SMOKA Overview and How To Search and Request Data](#)

SMOKA has been developed and maintained by Astronomical Data Archive Center (ADAC), Astronomy Data Center (ADC), National Astronomical Observatory of Japan (NAOJ). SMOKA distributes public data of the Subaru Telescope.

### Search the Archive through the

There are following ways to approach.

- [Simple Search](#) : search data from various search constraints
- [Advanced Search](#) : search data from various search constraints
- [Calendar Search](#) : search data from a calendar (observation date)
- [SUP Search](#) : search for SuprimeCam (SCI) data and astrometric calibrated data and COMQ data. **NEW!**
- [All Keywords Search](#) : search data from various search constraints
- [Full-Text Search](#) : search data from various search constraints. HISTORY and COMMENT) **NEW!**

- no account is required for searching on the archive
- an SMOKA account is required for data retrieval
- data types:
  - RAW data
  - WCS corrected data (SuprimeCam)
  - flat-fielded data (SuprimeCam)
- data are transferred by FTP, DLT or DAT
- Various query modes:
  - Simple Search
  - Advanced Search
  - Calendar Search
  - SUP Search (SuprimeCam) **New**
  - All Keyword Search (SuprimeCam) **New**
  - Full Text Search (SuprimeCam) **New**

### What's New

MOIRCS (Multi-Object Spectrograph) data from Subaru are released. 2006/6/30  
Kyoto-3DII (Kyoto Tridimensional Spectrograph II) data from Subaru are released. 2006/5/24  
New search interfaces (SUP Search, All Keywords Search, Full-Text Search) are opened. Simple search data, COMQ, are available. 2006/5/24

## SMOKA Arc

## Suprime-Cam Object Lis

A B C D E F G H I J K L M N O P

Name Resolve  NONE  S

• D

[Daddi \(180\)](#)[DARK \(20\)](#)[Dark 3 hours \(10\)](#)[DARK EXPOSURE](#)[Dark Exposure \(24\)](#)[Dark Test \(20\)](#)[DARK TEST \(70\)](#)[DarkSky \(250\)](#)[DarkSky2 \(90\)](#)[DarkSky3 \(50\)](#)[DARK CLOUD \(24\)](#)[Deep Survey 1 \(220\)](#)[Deep Survey 2 \(220\)](#)[Deep0145-04 \(1350\)](#)[DEEP1 \(80\)](#)[deep16\\_0 \(50\)](#)[deep16\\_1 \(60\)](#)[deep16\\_2 \(40\)](#)[deep16\\_3 \(50\)](#)[deep16\\_4 \(40\)](#)[DEEP2 \(80\)](#)[deep23\\_0 \(40\)](#)[deep23\\_1 \(40\)](#)

## Results for 'Daddi' from Suprime-Cam data

[Click here to know how to look search results.](#)Information of Subaru Data ([Problems](#), [Reduction Tools](#))

180 frames are found. The results are summarized below:

Instrument	Mode	Number of frames
SUP	Imaging	180

Thumbnail images.  Shot images. FlatFielding thumbnail images. Thumbnail images for estimation of FlatFielding. 

To retrieve data, mark checkboxes at columns of rows which correspond to the frames which you'd like to retrieve. Then push "Datarequest" button located before/after the table.

A link of "No." column will lead you to the detailed information of corresponding frame.

You can see the quicklook image, the header information, the astrometric calibration information and the Flat Fielding information, if exist.

To view other page of the query results, select the range of numbers from the list box located at the bottom of the table, then push "Go" button next to it.


No.	Raw Data	WCS	Flat Fielding	FRAMEID	DATA TYPE	OBJECT	FILTER	RA2000	DEC2000	DATE OBS	UT STAR
<a href="#">1</a>	<input type="checkbox"/>	No data	No data	SUPA00189880	OBJECT	Daddi	W-S-Z+	14:49:29.001	+08:59:27.42	2003-03-04 <a href="#">weather (mpg)</a>	14:24:32.86
<a href="#">2</a>	<input type="checkbox"/>	No data	No data	SUPA00189881	OBJECT	Daddi	W-S-Z+	14:49:29.001	+08:59:27.42	2003-03-04 <a href="#">weather (mpg)</a>	14:24:32.86
<a href="#">3</a>	<input type="checkbox"/>	No data	No data	SUPA00189882	OBJECT	Daddi	W-S-Z+	14:49:29.001	+08:59:27.42	2003-03-04 <a href="#">weather</a>	14:24:32.86

# Data Request Form

Enter your account name which you registered at [SMOKA account registration form](#).

Select media type by which you'd like to send the data.

"FTP" means you will access our ftp server and transfer the data via network.

Select your purpose why you request the following data.

If everything is good, push "OK" button at the bottom of the page.

Your Account:

Bytes of requested frames (approximately) 512,179,200

Media type:

Purpose:

Number of requested frames:

Requested FrameID

DLT7000	2003-03-04
4mm(DDS3)	2003-03-04
4mm(DDS4)	2003-03-04
SUPA00189880	2003-03-04
SUPA00189881	2003-03-04
SUPA00189882	2003-03-04
SUPA00189883	2003-03-04
SUPA00189884	2003-03-04
SUPA00189885	2003-03-04
SUPA00189886	2003-03-04
SUPA00189887	2003-03-04
SUPA00189888	2003-03-04
SUPA00189889	2003-03-04
SUPA00189890	2003-03-04
SUPW00189890	2003-03-04
SUPA00189891	2003-03-04
SUPW00189891	2003-03-04
SUPA00189892	2003-03-04
SUPW00189892	2003-03-04
SUPA00189893	2003-03-04

SMOKA - Mozilla Firefox

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# SMOKA Archive Advanced Search

[Click here for SUP Search \(Suprime-Cam data Search\).](#)  
[Click here to know how to search.](#)

Object Name (for name resolve)  Resolver  
 SIMBAD  NED   
 Don't Resolve

RA  Dec  Radius (arcmin)  Equinox   
Galactic Longitude  Galactic Latitude  Ecliptic Longitude  Ecliptic Latitude

Observation Date  Exp Time (sec)  Observer

Frame ID  Exposure ID

[Help...](#)

<u>Imagers</u> <input type="button" value="All"/> <input type="button" value="None"/>	<u>Spectrographs</u> <input type="button" value="All"/> <input type="button" value="None"/>	<u>Data Type</u> <input type="button" value="All"/> <input type="button" value="None"/>
<ul style="list-style-type: none"> <li>Subaru: Suprime-Cam</li> <li>Subaru: FOCAS</li> <li>Subaru: OHS/CISCO</li> <li>Subaru: IRCS</li> <li>Subaru: CIAO</li> <li>Subaru: COMICS</li> <li>Subaru: CAC</li> <li>Subaru: MIRTOS</li> <li>Subaru: MOIRCS</li> <li>Subaru: Kyoto-3DII</li> <li>Kiso: 1k CCD</li> <li>Kiso: 2k CCD</li> <li>Okayama: OASIS</li> </ul>	<ul style="list-style-type: none"> <li>Subaru: FOCAS</li> <li>Subaru: HDS</li> <li>Subaru: OHS/CISCO</li> <li>Subaru: IRCS</li> <li>Subaru: CIAO</li> <li>Subaru: COMICS</li> <li>Subaru: MOIRCS</li> <li>Subaru: Kyoto-3DII</li> <li>Okayama: SNG</li> <li>Okayama: HIDES</li> </ul>	<ul style="list-style-type: none"> <li>OBJECT</li> <li>BIAS</li> <li>DARK</li> <li>FLAT</li> <li>COMPARISON</li> </ul>

Observation Band    
Filter lists / Wavelength

### Output Options

Output columns

- FRAMEID
- OBS\_MODE
- DATA\_TYPE
- OBJECT
- FILTER/WVLEN
- DISPERSER

Order by: 1.   **reverse**

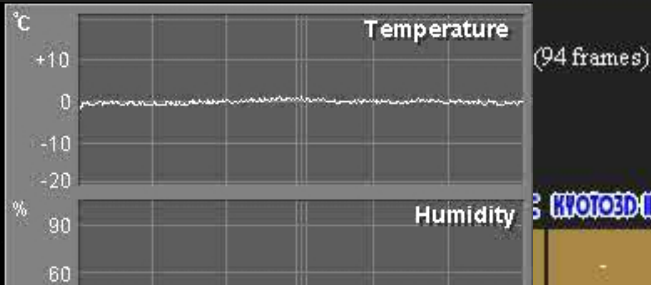
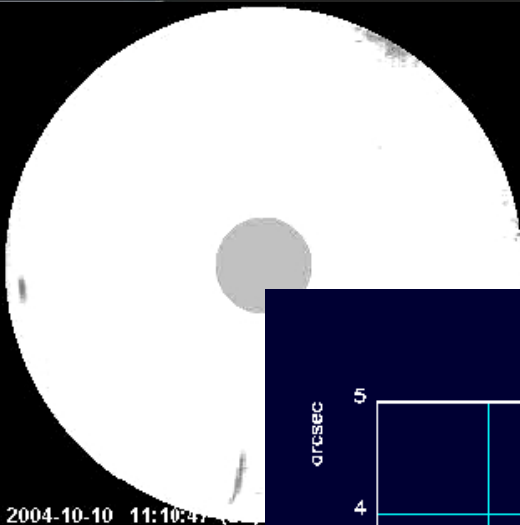
Maximum number of hits:

Output Equinox

[Show SQL Query](#)

[Toppage](#) | [Web Index](#) | [Overview](#) | [How to search data](#) | [Online-help](#) | [Help desk](#) |

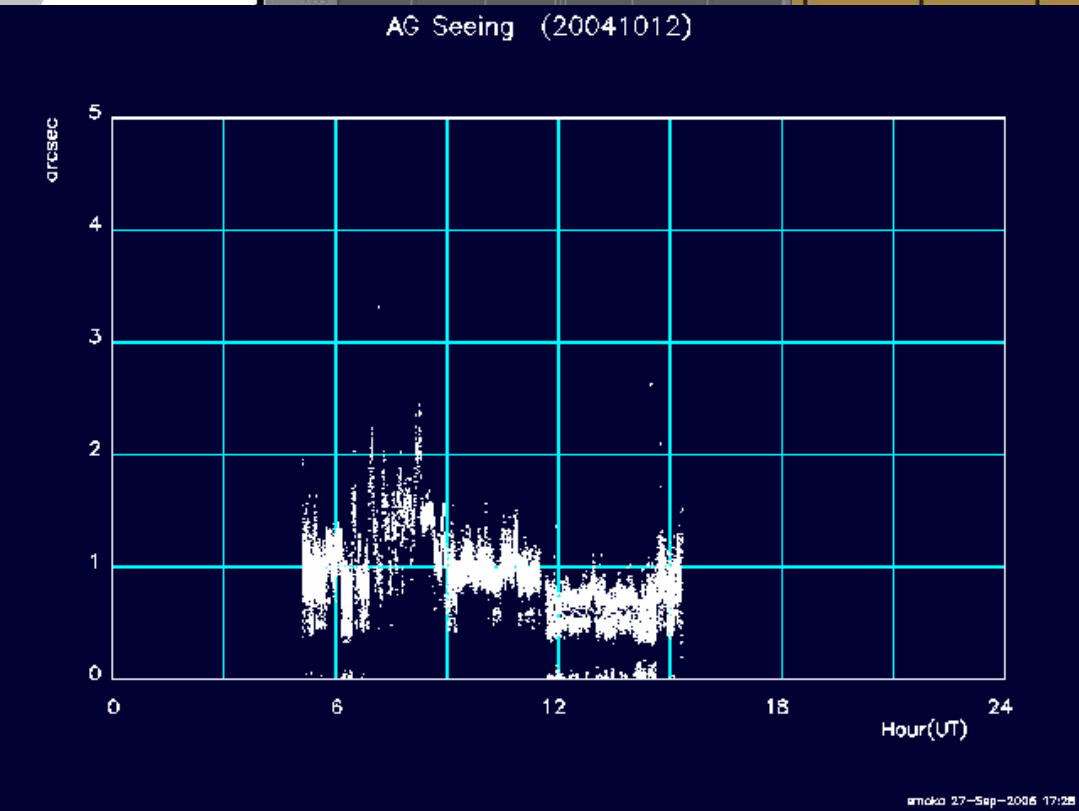
SUBA  
2004



Weather(Movie) AGSeeing SummitLog

2004/

2004-10-10 11:10:47  
Reference Time HST  
2004-10-10 01:10:00  
Reference Time UT  
2004-10-10 11:10:00



-	o03020	o	o	-
o	-	-	-	-
o	-	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-
o	o	-	-	-



# SMOKA Archive SUP Search

[Click here for Advanced Search.](#)  
[Click here to know how to search.](#)  
[Information of Subaru Data](#) ([Problems](#), [Reduction Tools](#))

<u>Object Name (for name resolve)</u> <input type="text"/>		<u>Resolver</u> <input checked="" type="radio"/> SIMBAD <input type="radio"/> NED <input type="button" value="Resolve"/> <input type="radio"/> Don't Resolve	
<u>RA</u> <input type="text"/>	<u>Dec</u> <input type="text"/>	<u>Radius (arcmin)</u> <input type="text" value="10.0"/>	<u>Equinox</u> <input type="text" value="J2000"/>
<u>Galactic Longitude</u> <input type="text"/>	<u>Galactic Latitude</u> <input type="text"/>	<u>Ecliptic Longitude</u> <input type="text"/>	<u>Ecliptic Latitude</u> <input type="text"/>
<u>Pin-point Search</u> <input type="radio"/> on <input checked="" type="radio"/> off			
<u>Observation Date</u> <input type="text"/>	<u>Exp Time (sec)</u> <input type="text"/>	<u>Observer</u> <input type="text"/>	
<u>Frame ID</u> <input type="text"/>		<u>Exposure ID</u> <input type="text"/>	

[Help...](#)

<u>Data Type</u> <input type="button" value="All"/> <input type="button" value="None"/> OBJECT BIAS DARK FLAT	<u>Filter lists</u> <input type="button" value="All"/> <input type="button" value="None"/> DECODERR I-A-L527 I-A-L574 I-A-L598 I-A-L624 I-A-L651
---	--



## SMOKA Archive All Keywords Search for SUP

[Click here for Full-Text Search.](#)

[Click here for All Keywords Search \(other instrument\).](#)

Query by constraints applied on FITS-Header-Keywords or derived Parameters

[Click here to know how to search.](#)

Please set constraint for search.

### SUP

Search		Reset		<a href="#">FITS Header Dictionary</a>					
No.	Keyword	Type	Query Constraints				Range or Examples		
1	FRAME_ID	Char	Val =	<input type="text"/>		Examples	SUPA00093614	SUPA00181299	SUPA00269324
2	PROPOSALID	Char	Val =	<input type="text"/>		Examples	o99000	o04152	o04153
3	RASEC	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	0.00	1295620.19
4	DECSEC	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-180755.27	321365.84
5	GALLONG	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	0.16551	359.91465
6	GALLAT	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-88.02229	88.42491
7	ECLLONG	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	0.01930	359.99932
8	ECLLAT	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-58.52167	89.90607
9	X_2000	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-0.999774	1.000000
10	Y_2000	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-0.999702	0.999986
11	Z_2000	Num	Min =	<input type="text"/>	Max =	<input type="text"/>	Min - Max	-0.768393	0.999918
12	<a href="#">NAXIS</a>	Int	2						

SMOKA - Mozilla Firefox

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# SMOKA Archive Full Text Search

[Click here for All Keywords Search.](#)

Query by constraints applied on FITS-Header-Keywords or derived Parameters  
[Click here to know how to search.](#)

**Instrument and Search Words**

Search Instrument : Subaru / Suprime-Cam

Search Word :

**Output Options**

Output columns




<div style="border: 1px solid black; padding: 2px;"> FRAMED <input type="button" value="v"/>  OBS_MODE  DATA_TYPE  OBJECT  FILTER/WVLEN  DISPERSER <input type="button" value="v"/> </div>	<u>Order by:</u> 1. FRAMED <input type="button" value="v"/> <input type="checkbox"/> reverse	<u>Maximum number of hits:</u> 20 <input type="button" value="v"/>  <u>Output Equinox</u> J2000 <input type="button" value="v"/>
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[Toppage](#) | [Web Index](#) | [Overview](#) | [How to search data](#) | [Online-help](#) | [Help desk](#) |  
[Simple Search](#) | [Advanced Search](#) | [SUP Search](#) | [Calendar Search](#) | [All Keywords Search](#) | [Full-Text Search](#)

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[data\\_center@dbc.nao.ac.jp](mailto:data_center@dbc.nao.ac.jp)  
SMOKA is operated by Astronomy Data Center  
and Subaru Telescope.

# Current Priority Issues

- **data search based on the quality parameters**
  - weather information, seeing, limiting magnitude...
  - Quality assessment system (NAQATA)
- **providing processed data**
  - reduced image/spectrum, co-added image, object catalog, spectrum line parameters...
  - Control the data quality
  - Researcher can devote himself to scientific analysis
  - Process the data at locations near (in term of network) the data archive
- **VO interface**
  - Interoperable data service

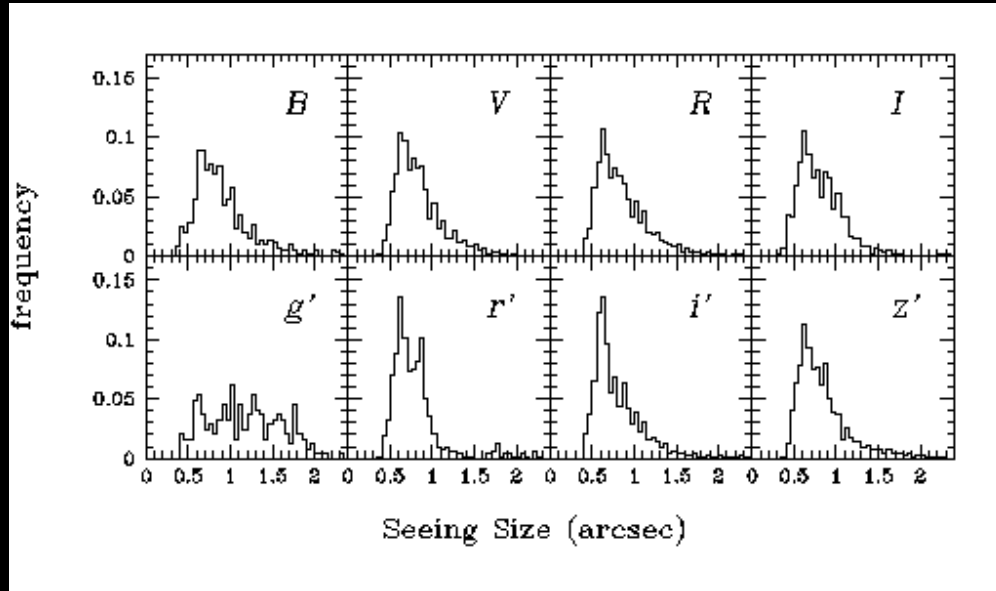


# Quality Assessment System (NAQATA)

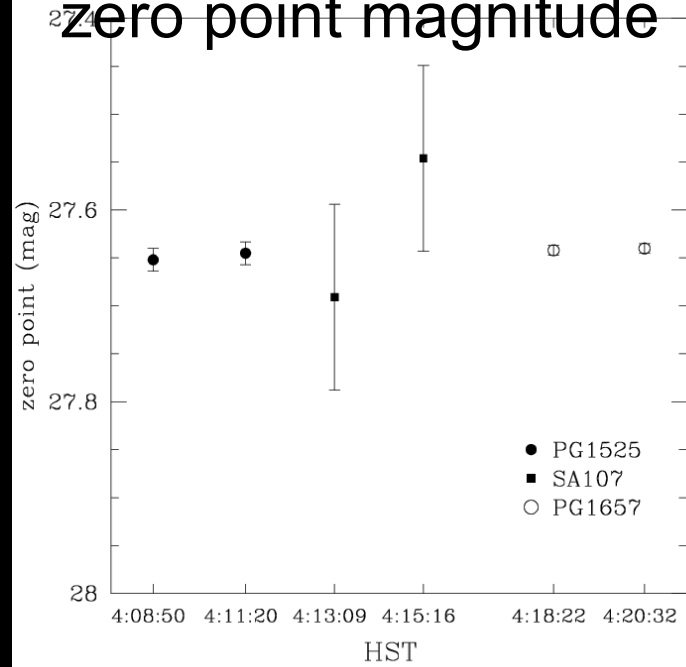
F. Nakata et al. Poster 2.16

- **FITS format check**
  - Check FITS standard compliance
- **FITS header information check**
  - Consistency check among the header values
  - Check if mandatory information is properly written
  - Check format of all the header values
- **Data quality evaluation (SuprimeCam)**
  - Photometric zero point
  - PSF and elongation
  - Trend analysis of bias and background level
  - Monitor of gain and readout noise of CCD

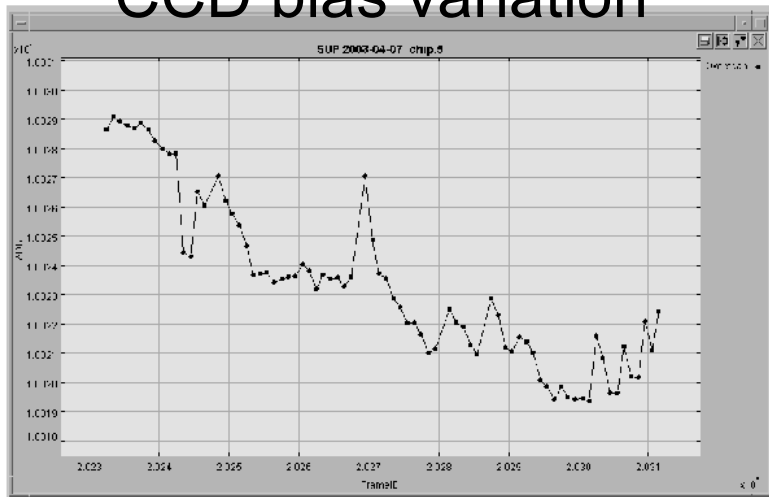
# PSF distribution



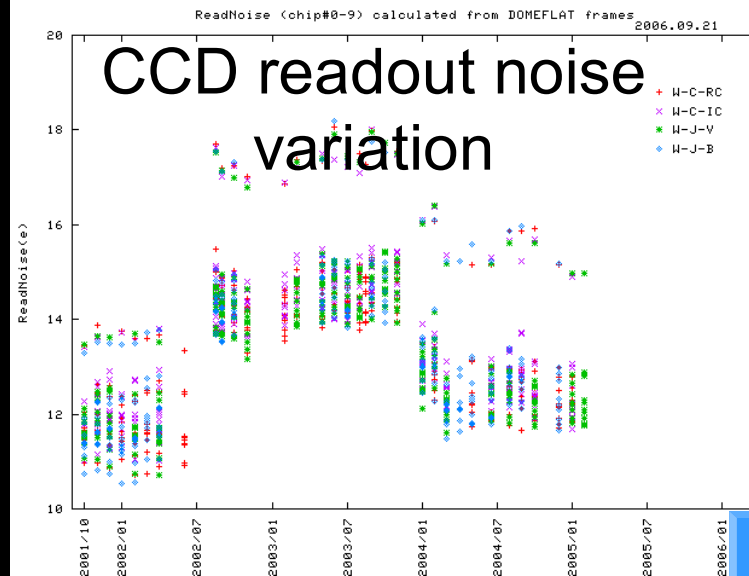
# zero point magnitude



# CCD bias variation



# CCD readout noise variation



# Necessity of the Quality Control

- Raw data reduction → knowledge about **characteristics of the detector** is indispensable
- Information on the **environment** → essential to derive a physical quantity correctly
- Archive users often have no knowledge of them → **remove the detector and environment dependency.**
- The quality of the data is **slowly** improved as a function of time (experience) → The reduction procedure at each release should be **referable**, and the data should be **reproducible**
- Data provider should owe the responsibility to manage the **reproducibility of the released data**



# Grid Computing

- **Subaru data reduction pipeline system**
  - Web service based GRID
  - Generates calibration data (Super-Flat) for all the SuprimeCam data in a week
  - On-the-fly data reduction with the pre-prepared Super-Flat
  - Users can access to the data reduced with the most recent algorithm
  - Also support the older version of pipeline
- **Backend computing system of the JVO**
  - catalog generation
  - photo-z calculation
  - Image arithmetic
  - ...

# Components of the Grid system

- **Computing resource management**
  - Monitoring and Discovery Service (MDS)
- **Data transfer**
  - FTP or HTTP get
- **Remote Job execution**
  - Web service (Tomcat + AXIS)
- **Authentication**
  - No authentication at resource by resource
- **All the components were developed by ourselves**
  - Plan to introduce **NAREGI GRID middleware**



# MDS Interface

## Computing Resource → MDS

```
void reportStatus(String hostId,  
                 double load, int njob)
```

```
void reportJobStatus(String hostId, int jobId,  
                    String status)
```

## Grid Client → MDS

```
ServiceInfo resolveService(String serviceId)
```

```
String getJobStatus(String hostId, int jobId)
```

```
...
```

# Job Execution and Data Transfer Interface

## Grid Client → Computing Resource

```
int submitJob(String command, String argv)
```

```
String getResultURL(int jobId)
```

```
String query(int jobId)
```

```
String finalize(int jobId)
```

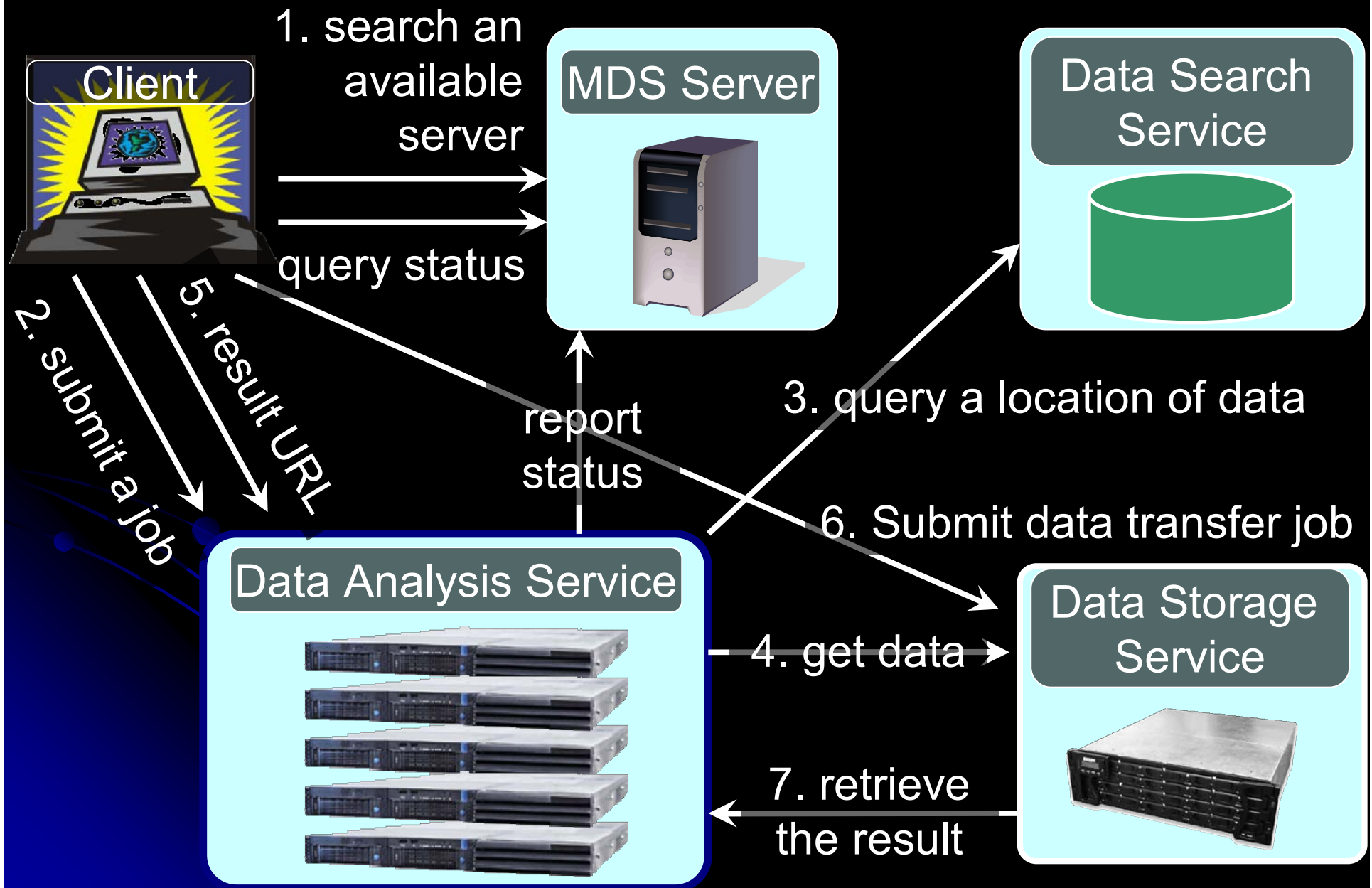
## Grid Client → Storage Resource

```
Int copyAsync(String src, String dest)
```

```
Void copy(String src, String dest)
```

```
Void finalize(int jobId)
```

# e.g. Subaru Grid Pipeline Arch.



# SuprimeCam Response Calculator

The screenshot shows a web browser window with two overlapping pages. The background page is titled 'Observa' and contains a table of observation data. The foreground page is titled 'Create Flat Calibration Frames' and has several input fields and a dropdown menu.

**Observation Table:**

Date					
2002-04-03					
2002-04-04					
2002-04-05					
2002-04-06					
2002-04-07					
2002-04-08					
2002-04-09					
2002-04-10					
2002-04-11					
2002-04-12	0	0	0	0	38
2002-04-13	0	0	9	14	0
2002-04-14	0	0	9	5	0
2002-04-15	0	3	0	0	11
2002-04-16	0	0	0	0	21

**Create Flat Calibration Frames Form:**

From: 2002-04-06 To: 2002-04-15 W-C-RC [v] All [v]  
exptime: 100 sec | max frames: 999 | max hum: [v]  
Submit Job  
Message: action=submitJob&start=2002-04-06&end= [v] Time=100&maxFrame [v]

**Dropdown Menu Options:**

- All
- si001s (3)
- si002s (4)
- si005s (2)
- si006s (5)
- w4c5 (8)
- w67c1 (0)
- w6c1 (1)
- w7c3 (9)
- w93c2 (6)

**Search and Navigation:**

Date: 2002 / [v]  
Search Obser [v]  
Skip: 3 days  
Message: action=searchObs&start=2002-4-3&limit=14&expTime=100&maxHum=100

## Job Status

### Submitted Job

job #	server id	job id	params	status
0	ivo://jvo/server/jvoh	1	-s 2002-03-01 -e 2002-03-31 -f W-C-RC -c si001s -t 100 -m 3 -H 80.0	finished
1	ivo://jvo/server/jvof	22	-s 2002-03-01 -e 2002-03-31 -f W-C-RC -c si002s -t 100 -m 3 -H 80.0	data transfer
2	ivo://jvo/server/jvoi	2	-s 2002-03-01 -e 2002-03-31 -f W-C-RC -c si005s -t 100 -m 3 -H 80.0	data transfer
3	ivo://jvo/server/jvoj	3	-s 2002-03-01 -e 2002-03-31 -f W-C-RC -c si006s -t 100 -m 3 -H 80.0	running
4	ivo://jvo/server/grid02	1	-s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w4c5 -t 100 -m 3 -H 80.0	running

- + 1 Update Interval: 100000 sec 0 5

### Unsubmitted Job

ivo://jvo/server/jvod d0/subaru/spcam/resp -s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w67c1

ivo://jvo/server/jvoe d1/subaru/spcam/resp -s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w6c1 -

ivo://jvo/server/jvoj d4/subaru/spcam/resp -s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w7c3 -

ivo://jvo/server/jvoi d2/subaru/spcam/resp -s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w93c2 -

ivo://jvo/server/jvoi d4/subaru/spcam/resp -s 2002-03-01 -e 2002-03-31 -f W-C-RC -c w9c2 -

- + 1 Update Interval: 100000 sec 0 5

Stop Register Remove

Message: /spcam/request.do?action=requestLog&logType=log1&offset=0&limit=5

# MDS Service Snap Shot

## Registered Hosts

remove	enable	disable	name	living	enabled	load	numJob	lastTime	ID	address	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	arisa	false	false	0.0	0	2006-07-15 13:26:38	ivo://jvo/server/arisa	192.168.0.4	Intel(R) 2.40GHz
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	grid01	true	true	1.61	2	2006-10-12 14:00:28	ivo://jvo/server/grid01	192.168.0.64	AMD Core F
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	grid02	true	true	1.02	2	2006-10-12 14:00:04	ivo://jvo/server/grid02	192.168.0.66	AMD Core F
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	grid03	true	true	0.56	2	2006-10-12 14:00:16	ivo://jvo/server/grid03	192.168.0.67	AMD Core F
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	grid10	true	true	0.0	0	2006-10-12 14:00:26	ivo://jvo/server/grid10	192.168.0.68	AMD Core F
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvo-work01	false	false	0.0	0	2006-07-15 13:26:40	ivo://jvo/server/jvo-work01	192.168.0.3	Intel(R) 3.00GHz
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvo-work02	false	false	0.0	0	2006-07-15 13:26:47	ivo://jvo/server/jvo-work02	192.168.0.3	Intel(R) 3.00GHz
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvod	true	true	0.0	0	2006-10-12 13:59:35	ivo://jvo/server/jvod	192.168.0.5	Intel(R) 2.80GHz
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvoe	true	false	0.0	0	2006-10-12 13:59:48	ivo://jvo/server/jvoe	133.40.212.45	Intel(R) 2.80GHz
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvof	true	true	0.76	0	2006-10-12 14:00:08	ivo://jvo/server/jvof	192.168.0.1	Xeon(
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvoh	true	false	0.0	0	2006-10-12 14:00:09	ivo://jvo/server/jvoh	192.168.0.7	Dual C Proces
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvoi	true	true	1.31	1	2006-10-12 14:00:14	ivo://jvo/server/jvoi	192.168.0.8	Dual C Proces
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	jvoj	true	true	2.15	3	2006-10-12 13:59:52	ivo://jvo/server/jvoj	192.168.0.9	Dual C Proces
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	piglet	false	false	0.69	1	2006-09-11 17:24:39	ivo://jvo/server/piglet	133.40.208.47	AMD 4000+
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	tiger	true	false	0.0	0	2006-10-12 14:00:22	ivo://jvo/server/tiger	192.168.0.65	AMD Core F

Host Name

Heart Beat Status

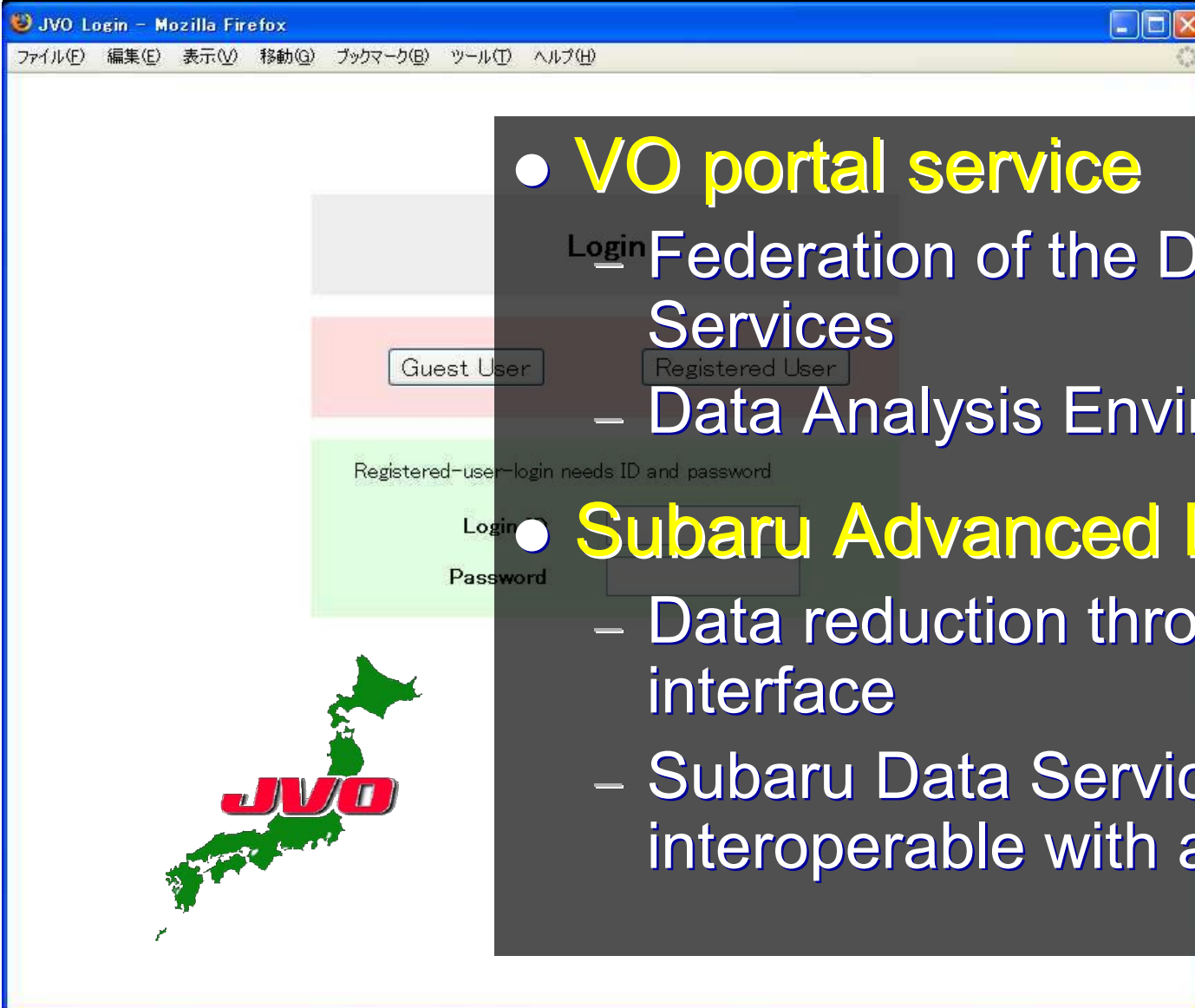
Load Average

Number of Submitted Job



# Japanese Virtual Observatory (JVO)

<http://jvo.nao.ac.jp/portal>



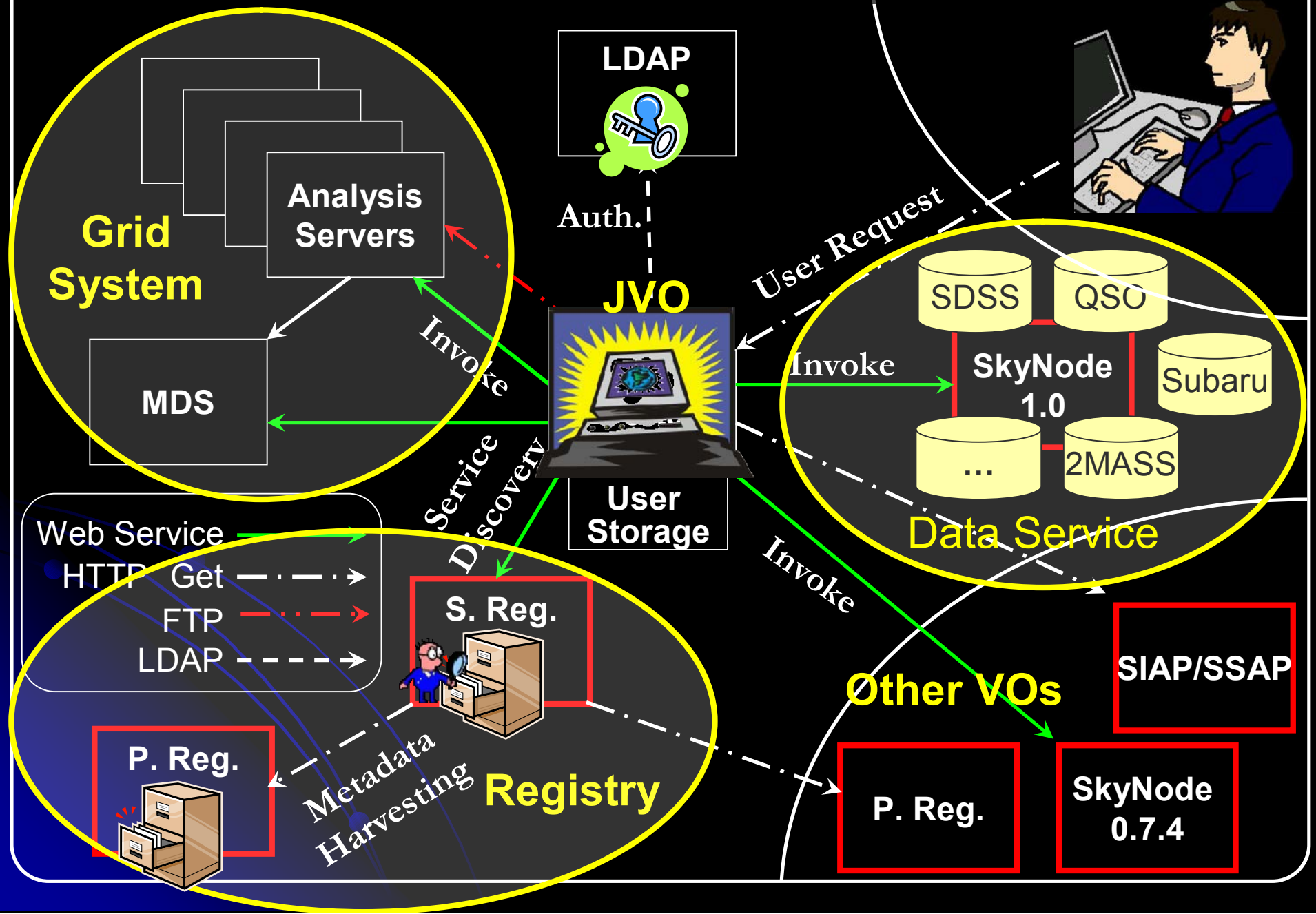
● **VO portal service**

- Federation of the Distributed VO Services
- Data Analysis Environment

● **Subaru Advanced Data Service**

- Data reduction through the Web interface
- Subaru Data Service interoperable with any VO service

# Overview of the JVO Portal Service





# JVO Data Search

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [QSO](#) | [DataViewer](#) | [Usage](#) | [Logout](#)

⇒ [Multiple](#) | [Single](#) | [JVOQL](#) | [Subaru](#)

Coordinates or Object Name

Data Search

FK5 ▾

Radius:

arc min ▾

Samples:  ▾

User ID	User Name	Group	Last Login
guest_1160786330902_77	I am a guset	guest	---

# JVO Simple Data Search

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [QSO](#) | [DataViewer](#) | [Usage](#) | [Logout](#)  
⇒ [Multiple](#) | [Single](#) | [JVOQL](#) | [Subaru](#)

## Find Data Service

1. Search a data service by keywords

HIP

AND

Search Service

## Selected Services

### The Hipparcos Main Catalogue

2. Select a Table

[ivo://jvo/hip/hip\\_main](ivo://jvo/hip/hip_main)

table name	select	description
hip_main	Select Table	The Hipparcos Main Catalogue (ESA 1997)

## Search Region

Selected Table: hip\_main

3. Specify a Search Region

Object Name:  Name Resolver

Coordinate:  Frame: FK5

Radius:  deg

# VOTable Viewer

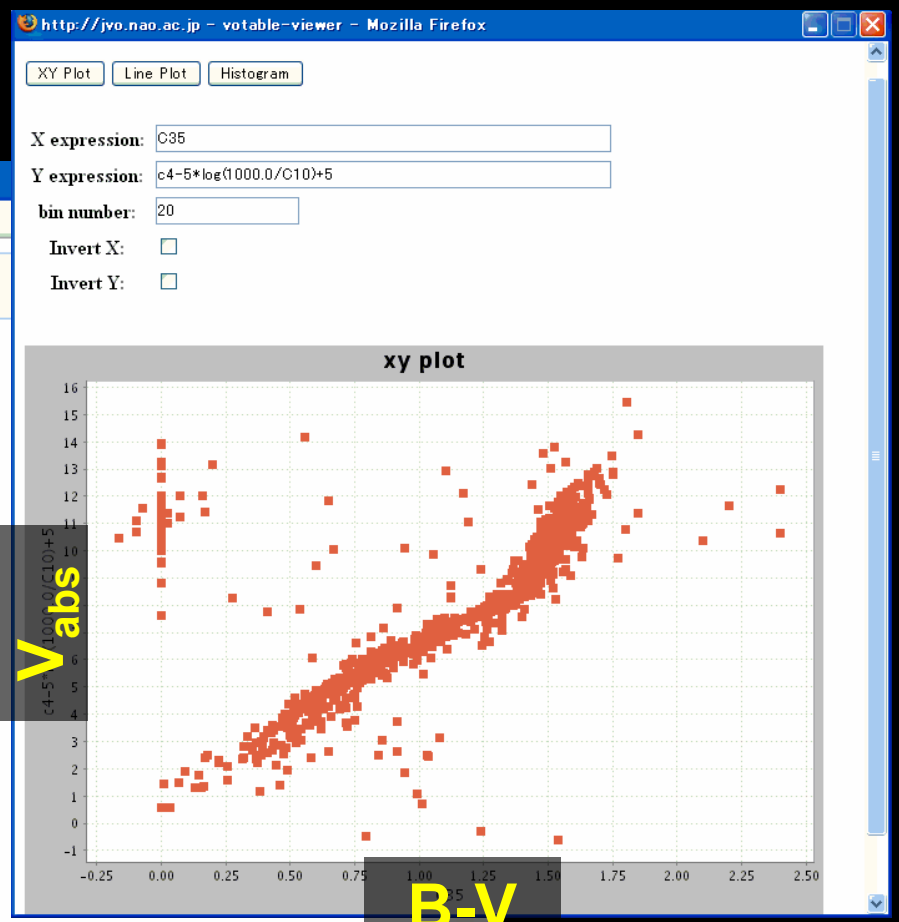
[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [QSO](#) | [DataViewer](#) | [Usage](#) | [Logout](#)

Metadata:

MESSAGE: OK  
FROM: 0 MAX: 20 SCROLL: 1  
SELECT: c7,c8,c10,c35,c4  
FILTER: C35<2.5  
ORDER:

933records,  
1 2 3 4 5 6 7 8 9 10

Alias Name		C7	C8	C10	C35	C4	
#	check	download	<input type="button" value="T.RA"/>	<input type="button" value="T.DEC"/>	<input type="button" value="T.P LX"/>	<input type="button" value="T.B_V"/>	<input type="button" value="T.VMAG"/>
0			0.53502094745636	-68.2802047729492	63.03	1.39	9.24
1			0.540187776088715	27.0844898223877	80.63	0.69	5.8
2			1.29233646392822	45.7869338989258	86.98	1.472	9.95
3			1.32445347309113	-67.8312301635742	62.48	1.076	8.49



## JVO Data Search

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⇒ [Multiple](#) | [Single](#) | [JVOQL](#) | [Subaru](#)

### Input JVOQL

```
SELECT ir.object, ir.flux_iso_45, opt.number, opt.mag_auto_B,  
       opt.mag_auto_V, opt.mag_auto_R, opt.mag_auto_I,  
       opt.mag_auto_Z,  
       img.object, img.filter_id, img.access_ref, img.format  
FROM   ivo://jvo/skynodej/sxds:sxdsr1 AS opt,  
       ivo://jvo/skynodej/sxds:swire_xmm AS ir,  
       ivo://jvo/subaru:spcam_mos_view AS img  
WHERE  Region('Circle 34.2 -5.0 0.05') AND opt.mag_auto_R < 24  
       AND distance((ir.ra, ir.dec), (opt.ra, opt.dec)) < 2 [arcsec]  
       AND img.region = BOX((opt.ra, opt.dec), 0.02, 0.02)  
       AND img.filter_id = 'W-C-RC'
```

### Distributed Database Query by JVOQL

- Cross match between the Subaru and Spitzer catalog
- Cutout SuprimeCam images

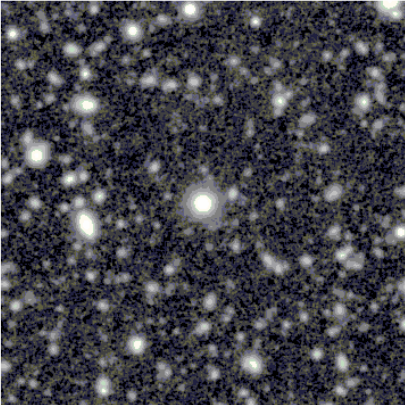
### Simple Image Viewer - Mozilla Firefox

ファイル(F) 編集(E) 表示(V) 移動(M) ブックマーク(B) ツール(T) ヘルプ(H)

## Data Viewer

Status | Registry | Search | Workflow | Result | QSO | DataViewer | Usage | Logout

Name	Origin	Scale	Contrast
tmp0	http://jvo.nao.ac.jp/	hist	min = 0.0 max = 0.0 auto = true

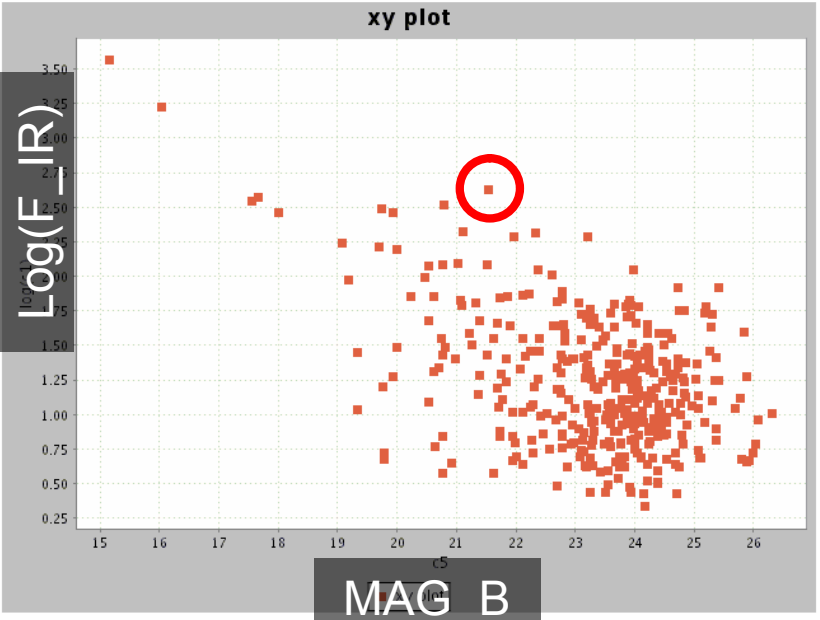


Scale : hist eq  
auto  
Contrast : min = 0.0 max = 0.0  
Change  
VOTable :  
Overplot

### http://jvo.nao.ac.jp - votable-viewer - Mozilla Firefox

X expression: c5  
Y expression: log(c1)  
bin number: 20  
Invert X:   
Invert Y:

### xy plot



Log(F\_IR)

MAG\_B

### votable-viewer - Mozilla Firefox

ファイル(F) 編集(E) 表示(V) 移動(M)

## VOTable View

Status | Registry | Search | Workflow

Metadata:

MESSAGE:

FROM: 0 MAX: 20 SCROLL: 1

SELECT: c0,c1,c2,c3,c4,c5,c6,c7,c8,c9,c10,c11,c12,c13

FILTER:

ORDER:

800 records,  
1 2 3 4 5 6 7 8 9 10

	Alias Name	C0	C1	C2	C3	C4	C5	C6
#	check download	<input type="button" value="IR.OBJECT"/>	<input type="button" value="IR.FLUX_ISO_45"/>	<input type="button" value="IR.RA"/>	<input type="button" value="IR.DEC"/>	<input type="button" value="OPT.NUMBER"/>	<input type="button" value="OPT.MAG_AUTO_B"/>	<input type="button" value="OPT.MAG_AUTO_R"/>
0	<input type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021648.87-045812.0	3663.32006835938	34.2036514282227	-4.97001981735229	SXDS-RC-088303	15.1500997543335	14.792591
1	<input type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021700.24-050112.7	1676.02001953125	34.2510414123535	-5.02021980285645	SXDS-RC-067315	16.025899887085	15.651801
2	<input checked="" type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021705.98-045953.3	422.559997558594	34.2749404907227	-4.99815988540649	SXDS-RC-092411	21.533899307251	20.075701
3	<input type="checkbox"/> <a href="#">Download</a>	SWIRE2_J021704.82-045409.2	370.059997558594	34.2701187133789	-4.90256977081299	SXDS-RC-125356	17.6541996002197	17.301091

# JVO Subaru Data Search

[Status](#) | [Registry](#) | [Search](#) | [Workflow](#) | [Result](#) | [QSO](#) | [DataViewer](#) | [Usage](#) | [Logout](#)

⇒ [Multiple](#) | [Single](#) | [JVOQL](#) | Subaru

## Dataset

Instrument	Table	Execute Query
SUP	spcam_ccd	<input type="button" value="Submit"/>

## Search Region

	Target Name	Coordinate	Radius
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	10 arcmin
<input type="text"/>			

## Observation Period:

	date			time		
<input type="checkbox"/> LATER THAN:	2000	/	1	/	1	0 : 00 : 00
<input type="checkbox"/> EARLIER THAN:	2000	/	1	/	1	0 : 00 : 00

## Search by OBJECT name

Object

– Reduction **10s**  
 (Bias+Flat+Distortion+Astr  
 omeoty)  
 – Transfer **30s**

votable-viewer - Mozilla Firefox

ファイル(F) 編集(E) 表示(V) 移動(Q) ブックマーク(B) ツール(T) ヘルプ(H)

## VOTable Viewer

Status | Registry | Search | Workflow | Result | QSO | DataViewer | Usage | Logout

Metadata:

MESSAGE:

FROM:  MAX:  SCROLL:

SELECT:

FILTER:

ORDER:

1000records,  
 1 2 3 4 5 6 7 8 9 10

	Alias Name	C31	C32	C1	C2	C3	C4	C5	
#	check	download	<input type="button" value="._TO.ACCESS_REF_RESP"/>	<input type="button" value="._TO.ACCESS_REF_RAW"/>	<input type="button" value="._TO.RAW_ID"/>	<input type="button" value="._TO.UT_START"/>	<input type="button" value="._TO.EXPTIME"/>	<input type="button" value="._TO.FILTER_ID"/>	<input type="button" value="._TO.DETECTOR_ID"/>
0	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134470	2002-09-30 11:11:47.326	900.0	W-J-B	w67c1	
1	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134480	2002-09-30 11:27:47.082	900.0	W-J-B	w67c1	
2	<input type="checkbox"/>	<a href="#">Download</a>	<a href="#">Link</a>	SUPA00134490	2002-09-30 11:42:44.412	900.0	W-J-B	w67c1	

Aladin v3.7 multiview

Load... Save... Tools... Print... Help... Quit

Position J2000 02:19:05.43 -04:55:01.9 Pixel 8 bits 027 / 255

SUPA00130730.fits SUPA00130730+SUPR0607291038430727.fits

select  
 dist  
 dfaw  
 tag  
 text  
 filter  
 rgb  
 assoc  
 isamp  
 cont  
 zoom  
 mglss  
 pixel  
 prop  
 del

SUPA00130730  
 SUPA00130730

6.85' x 13.47' 6.84' x 13.66'

multiview New B1] - SUPA00130730+SUPR0607291038430727.fits - Local file [C:\DOCUME~1\ysh Zoom 1/8x

(c)1999-2006 ULP/CNRS - Centre de Donnees astronomiques de Strasbourg 2 planes, 2 views, 28Mb

# Summary

- Functionality of searching SuprimeCam data based on the data quality indices is implemented on SMOKA
- SMOKA has started to provide reduced data of SuprimeCam since Sep 2004
- Subaru reduction pipeline system based on the GRID architecture is under construction.
- Subaru data analysis environment will be provided on the JVO portal.