



木曾シュミットシンポジウム2019

木曾シュミット乾板のデジタル化

公開システムの開発

国立天文台 天文データセンター

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他 木曾観測所乾板デジタル化チーム

2019/07/09



木曾シュミットシンポジウム2019

木曾シュミット乾板のデジタル化 公開システムの開発

☺ 乾板データのFITS化

- 🔑 乾板について
- 🔑 カタログ情報について
- 🔑 FITS ファイルについて

☺ 公開システムについて

- 🔑 検索機能について
- 🔑 データ請求機能について

☺ まとめと今後

乾板について

木曾観測所で現在保管されている、木曾シュミット望遠鏡で撮られた乾板 (プレート番号: 0001 ~ 7039)

- 観測日: 1975/04/25 ~ 1998/01/22

乾板

スキャン

2015/09 ~ 2019/03
@木曾観測所

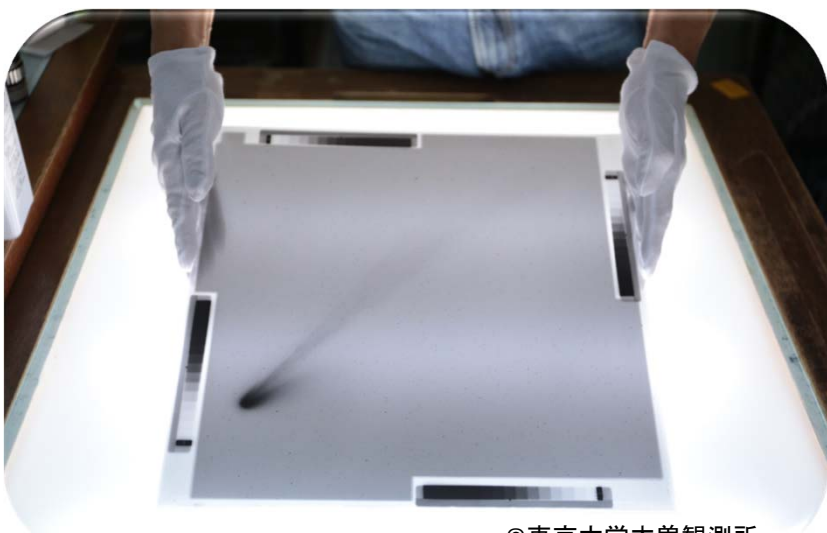
TIFFファイル



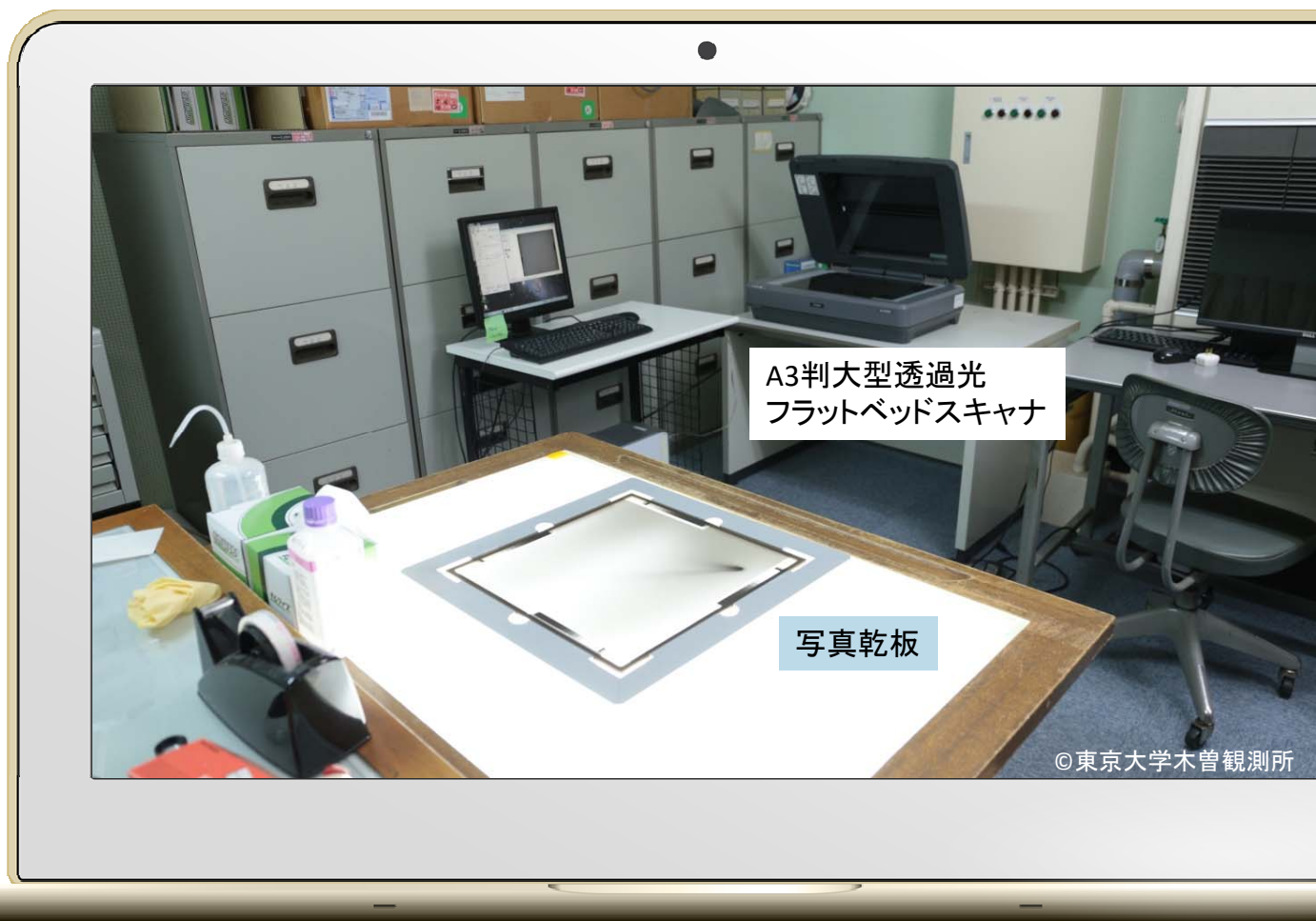
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Information on Kiso Plate

乾板について



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A3判大型透過光
フラットベッドスキャナ

写真乾板

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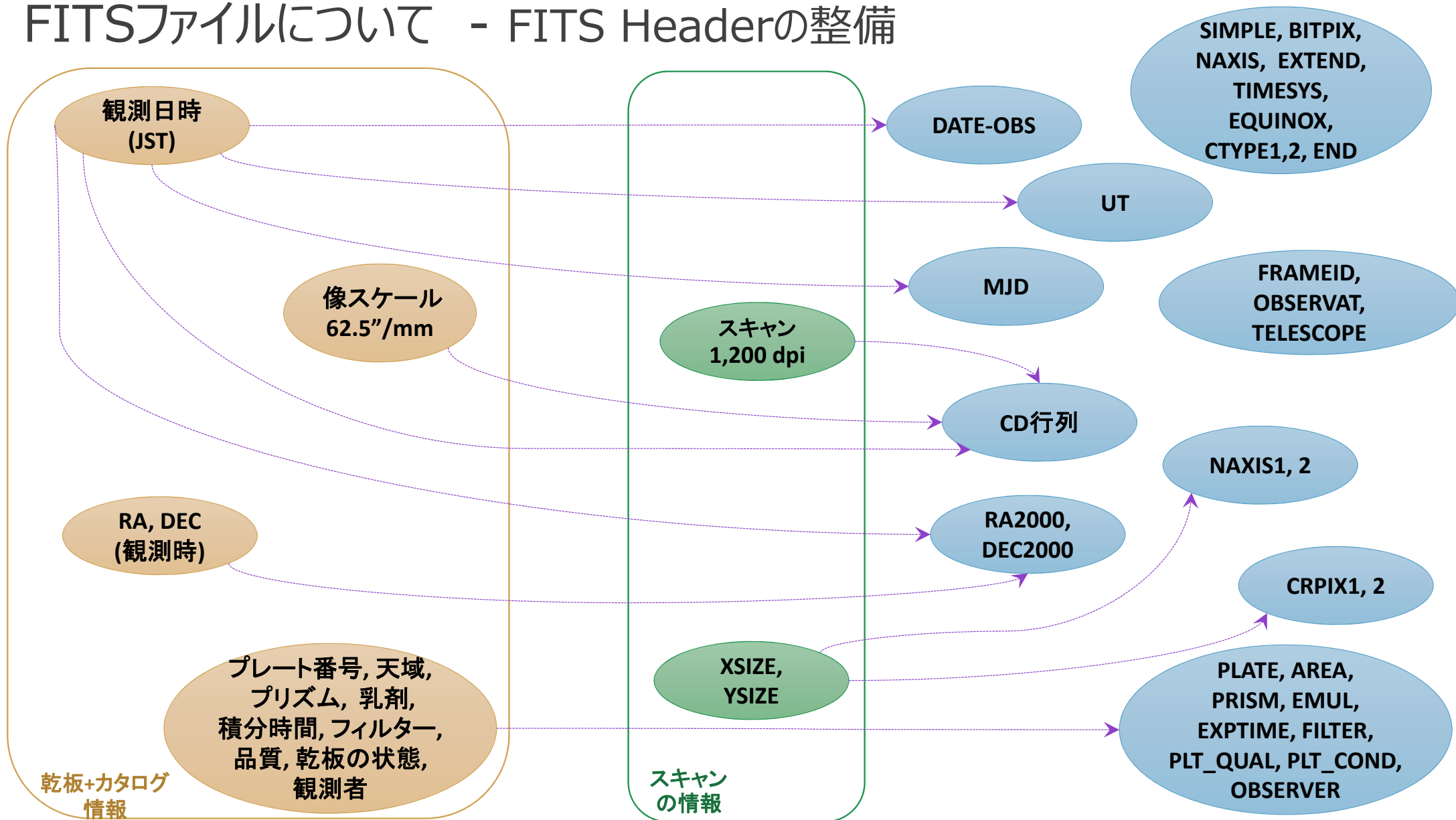
カタログ情報について

S00001	19750425235418	0103	14:20.6+064:53	1-N-	120.0	69-1	B	C	A	N	ISHIDA, OHASHI, HAMAJIMA
L00002	19750430210335	0104	14:40.5+064:53	3AJ-	120.0	45-1	C	C	A	N	ISHIDA, HAMAJIMA
S00003	19750430240518	0423	13:21.2+034:52	1-N-	120.0	NONE		C	A	N	ISHIDA, HAMAJIMA
L00004	19750506222317	0104	14:42.0+064:43	2AO-	120.3	U1-1	B	B	A	N	SOYANO, HAMAJIMA
L00005	19750507221141	0855	13:21.3+004:52	2AO-	102.2	U1-1	B	B	A	N	ISHIDA, HAMAJIMA, SOYANO
L00006	19750512204600	0423	13:21.2+034:52	2AO-	120.0	U1-2	B	C	A	N	ISHIDA, OHASHI
L00007	19750512235700	0855	13:21.3+004:52	2AO-	120.0	U1-2	B	C	A	N	ISHIDA, OHASHI
L00008	19750517214614	1292	15:01.5-025:06	3AJ-	120.0	45-2	B	C	A	N	TAKASE, MAEHARA
L00009	19750517241512	1292	15:01.5-025:06	2AO-	120.0	U1-2	C	B	A	N	TAKASE, MAEHARA
L00010	19750522252838	1158	18:21.5-014:59	2AO-	120.0	U1-2	B	C	A	N	ISHIDA, MIYAMOTO
S00011	19750525231924	0437	18:06.4+036:00	1-N-	065.0	69-2	B	C	A	N	ISHIDA K, HAMAJIMA K
S00012	19750527212032	0104	14:50.8+065:53	1-N-	064.3	69-2	B	C	A	N	OHASHI M, SOYANO T
L00013	19750603245000	1158	18:21.5-014:59	2AO-	015.0	38-2	B	B	A	N	ISHIDA K, AOKI T
L00014	19750603251935	1158	18:21.5-014:59	1AD-	010.9	49-1	B	C	A	N	ISHIDA K, AOKI T
L00015	19750608202414	9999	12:59.1+028:06	3AJ-	119.9	45-2	C	C	A	N	TAKASE, SOYANO
L00016	19750608225802	9999	12:59.1+028:06	2AO-	015.2	NONE	B	C	A	N	TAKASE, SOYANO
L00017	19750609231505	0428	15:01.0+034:54	1AD-	020.0	49-2	B	B	A	N	SOYANO, HAMAJIMA
L00018	19750609231505	0428	15:01.0+034:54	2AO-	020.2	NONE	B	C	A	N	SOYANO, HAMAJIMA
L00019	19750729212417	0111	19:20.2+065:03	3AJ-	119.9	45-2	C	C	A	N	ISHIDA K, TANAKA W
L00020	19750730213430	0111	19:20.2+065:03	3AJ-	119.9	45-2	C	C	A	N	ISHIDA K, SOYANO T
L00021	19750730234746	0143	15:00.6+059:54	2AO-	010.2	38-2	C	B	A	N	ISHIDA K, SOYANO T
L00022	19750731203201	0005	07:19.6+084:57	3AJ-	119.9	45-2	C	C	A	N	ISHIDA K, AOKI T
L00023	19750802213527	0003	02:29.4+085:07	3AJ-	119.9	45-2	B	C	A	N	AOKI T, HAMAJIMA K
L00024	19750803213643	0183	13:21.0+054:52	2AO-	040.1	38-2		B	A	N	AOKI T, HAMAJIMA K
L00025	19750819202115	0433	16:40.9+034:57	2AO-	005.2	38-2		C	A	N	ISHIDA K, TANAKA W
L00026	19750819210000	0001	12:00.7+089:51	3AJ-		45-2					ISHIDA K, TANAKA W
S00027	19750819230000	0001	12:01.0+089:43	1-N-		69-2					ISHIDA K, AOKI T
L00028	19750930233313	0325	00:49.4+040:09	2AO-		U1-1					SOYANO T, HAMAJIMA K
S00029	19750930252238	0460	01:37.0+031:08	3AJ-		45-1					SOYANO T, HAMAJIMA K
S00030	19751005263744	0976	05:39.8-005:20	2AO-	006.0	NONE	B	B	A	N	TAKASE B, AOKI T

プレート 観測日時 天域 RA DEC プリズム乳剤 積分 フィルター 品質 乾板の状態 (サイズ含) (JST) 時間

観測者

FITSファイルについて - FITS Headerの整備



木曾乾板の FITS ヘッダー サンプル

FITS Header Information on KSP00001

```
SIMPLE =                               T / conforms to FITS standard
BITPIX =                               8 / array data type
NAXIS  =                               2 / number of array dimensions
NAXIS1 =                               11002
NAXIS2 =                               11160
EXTEND  =                               T
PLATE   = 'S00001 ' / Plate size and number (Plate size: L/S/D/T)
FRAMEID = 'KSP00001' / Image sequential number in archive
OBSERVAT= 'Kiso Observatory' / Observatory
TELESCOP= 'Kiso 105cm Schmidt' / Telescope name
TIMESYS = 'UTC ' / Time System used in the header
DATE-OBS= '1975-04-25' / [UTC] Observation start date (yyyy-mm-dd)
UT       = '14:54:18' / HH:MM:SS.S UTC at the start exposure time
MJD      = 42527.62104167 / Modified Julian Date at the start exposure time
RA2000   = '14:21:11.503' / Right ascension of telescope pointing (J2000)
DEC2000  = '+64:46:16.26' / Declination of telescope pointing (J2000)
EQUINOX  = 2000.0 / Standard FK5 (years)
CTYPE1   = 'RA---ARC' / Pixel coordinate system
CTYPE2   = 'DEC--ARC' / Pixel coordinate system
CRPIX1   = 5501.0 / Reference pixel in X (pixel)
CRPIX2   = 5580.0 / Reference pixel in Y (pixel)
CUNIT1   = 'degree ' / Units of CRVAL1
CUNIT2   = 'degree ' / Units of CRVAL2
CRVAL1   = 215.2979296690909 / Physical value of the reference pixel X
CRVAL2   = 64.77118246057508 / Physical value of the reference pixel Y
CD1_1    = -0.00036999872684773 / Pixel Coordinate transformation matrix
CD1_2    = 9.70634357679860E-07 / Pixel Coordinate transformation matrix
CD2_1    = 9.70634357679860E-07 / Pixel Coordinate transformation matrix
CD2_2    = 0.000369998726847733 / Pixel Coordinate transformation matrix
AREA     = '0103 ' / Celestial area number
EMUL     = '1-N- ' / Emulsion type
EXPTIME  = 120.0 / [min] Exposure time
FILTER   = '69-1 ' / Filter name
OBSERVER= 'ISHIDA,OHASHI,HAMAJIMA ' / Observers name
PLT_COND= 'N ' / Condition of the plate (N/B/M/T)
HISTORY  FITS file provided by SMOKA at Fri Jul 05 15:51:53 JST 2019
END
```

公開システムについて

SMOKA Kiso Schmidt Plate Archive Search

To learn more about KSPsearch, please visit [our documentation page](#).

検索ボタン

プレート名 Search プレートサイズ Search

Plate ID: S00001 Plate Size: L S Uncheck

赤経 赤緯 半径

R.A.: 00:00:00.00 Dec: +00:00:00.0 Radius [arcmin]: 10.0

DATE-OBS: 1975-04-25 観測日

Prism: 2DA+ (All), 2DA- (None), 2DD+ (All), 2DD- (None), 4D (None)

Filter: 04SP (All), 38-1 (All), 38-2 (None), 45-1 (None), 45-2 (None)

Emulsion: 098+ (All), 098- (All), 1-N+ (All), 1-N- (None), 1-Z+ (None)

結果の表示数制限

Output Option: Limit Num of Results: 8000

リセットボタン

RESET

[Toppage](#)

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Feel free to contact [helpdesk](#) if you have any questions.
Last-modified: Tue Apr 16 15:44:31 IST 2019

SMOKA Kiso Schmidt Plate Archive Search

To learn more about KSPsearch, please visit [our documentation page](#).

Search Conditions Search

Plate ID: S00001 Plate Size: L S Uncheck

R.A.: 00:00:00.00 Dec: +00:00:00.0 Radius [arcmin]: 10.0

DATE-OBS: 1975-04-25

Output Option: Limit Num of Results: 8000

Prism: 2DA+ (All), 2DA- (None), 2DD+ (All), 2DD- (None), 4D (None)

Filter: 04SP (All), 38-1 (All), 38-2 (None), 45-1 (None), 45-2 (None)

Emulsion: 098+ (All), 098- (All), 1-N+ (All), 1-N- (None), 1-Z+ (None)

RESET

[Toppage](#)

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Feel free to contact [helpdesk](#) if you have any questions.
Last-modified: Tue Apr 16 15:44:31 JST 2019

Kiso Schmidt Plate Archive Search

DBの構成 と 実ファイル

① ⇒ ②

- FITSヘッダに書き込める値に整形
- 一部の値は変換計算して登録
- UT, DATE_OBS, EPO

② ⇒ ③

- 管理情報を抽出
- FRAME_ID, DATE_OBS, etc.
- ファイルの存在、タイムスタンプ等登録

② ⇒ ④

- 検索に必要な値を抽出
- 一部の値は計算して入力
- RA2000, DEC2000, X_2000, Y_2000, Z_2000

1

カタログ情報 テーブル

Column	Type	Modifiers
plate	character varying(6)	not null
ymdhms	character varying(14)	
area	character(4)	
ra	character(7)	
dec	character(7)	
prism	character varying(4)	
emul	character varying(4)	
exp	numeric(5,1)	
filter	character(4)	
i	character(1)	
w	character(1)	
d	character(1)	
s	character(1)	
c	character(1)	
observer	character varying(80)	

カタログ情報
そのまま

2

プレート情報 ビュー

Column	Type	Modifiers
plate	character varying(6)	
date_obs	date	
ut	text	
ep0	numeric	
area	character(4)	
ra	character(7)	
dec	character(7)	
prism	character varying(4)	
emulsion	character varying(4)	
exptime	numeric(5,1)	
filter	character(4)	
plt_qual	text	
condition	character(1)	
observer	character varying(80)	

4

検索 テーブル

Column	Type	Modifiers
frame_id	character varying(8)	not null
plate	character varying(6)	
date_obs	character varying(10)	
ut	character varying(8)	
ep0	numeric(7,2)	
area	character(4)	
ra	character(7)	
dec	character(7)	
prism	character varying(4)	
emulsion	character varying(4)	
exptime	numeric(5,1)	
filter	character(4)	
plt_qual	character varying(4)	
condition	character(1)	
observer	character varying(80)	
frameid	character varying(8)	
ra2000	character varying(12)	
dec2000	character varying(12)	
mjd	numeric(16,8)	
x_2000	numeric(8,6)	
y_2000	numeric(8,6)	
z_2000	numeric(8,6)	

3

ファイル管理 テーブル

Column	Type	Modifiers
frame_id	character varying(20)	not null
date_obs	character varying(30)	not null
mjd	numeric(20,8)	not null
fits_flag	character varying(1)	not null
fits_path	character varying(80)	
fits_size	bigint	
fits_time	character varying(20)	
memo	character varying(120)	
db_flag	character varying(1)	not null
trouble	character varying(1)	
thumb_flag	character varying(1)	
thumb_path	character varying(80)	
thumb_size	integer	
thumb_time	character varying(20)	
fits_md5sum	character varying(32)	
tiff_flag	character varying(1)	
tiff_path	character varying(80)	
tiff_size	integer	
tiff_time	character varying(20)	

FITS
ファイル

サムネイル
ファイル

TIFF
ファイル

公開システムについて

Kiso Schmidt Plate Digital Arch X

https://du02.dc.nao.ac.jp/KSPsearch

Results

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

7035 plates were found.
The results are summarized below:
Thumbnail images. [VIEW](#)

To retrieve data, mark checkboxes at the "FITS" column 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 the header information if exist.

No.	FITS	FRAME_ID	PLATEID	DATE_OBS	FITS_SIZE	RA2000	DEC2000	UT	PRISM	EMULSION	EXPTIME	FILTER	PLT_QUAL	CONDITION	OBSERVER	More
1	<input type="checkbox"/>	KSP00001	S00001	1975-04-25	117	14:21:11.503	+64:46:16.26	14:54:18		1-N-	120.0	69-1		N	ISHIDA,OHASHI,HAMAJIMA	
2	<input type="checkbox"/>	KSP00002	L00002	1975-04-30	225	14:41:00.679	+64:46:42.60	12:03:35		3AJ-	120.0	45-1		N	ISHIDA,HAMAJIMA	
3	<input type="checkbox"/>	KSP00003	S00003	1975-04-30	119	13:22:19.919	+34:44:16.95	15:05:18		1-N-	120.0	NONE		N	ISHIDA,HAMAJIMA	
4	<input type="checkbox"/>	KSP00004	L00004	1975-05-06	225	14:42:30.647	+64:36:45.00	13:23:17		2AO-	120.3	U1-1		N	SOYANO,HAMAJIMA	
5	<input type="checkbox"/>	KSP00005	L00005	1975-05-07	225	13:22:32.890	+04:44:17.29	13:11:41		2AO-	102.2	U1-1		N	ISHIDA,HAMAJIMA,SOYANO	
6	<input type="checkbox"/>	KSP00006	L00006	1975-05-12	225	13:22:19.837	+34:44:17.52	11:46:00		2AO-	120.0	U1-2		N	ISHIDA,OHASHI	
7	<input type="checkbox"/>	KSP00007	L00007	1975-05-12	225	13:22:32.860	+04:44:17.48	14:57:00		2AO-	120.0	U1-2		N	ISHIDA,OHASHI	
8	<input type="checkbox"/>	KSP00008	L00008	1975-05-17	225	15:02:56.801	-25:11:45.58	12:46:14		3AJ-	120.0	45-2		N	TAKASE,MAEHARA	
9	<input type="checkbox"/>	KSP00009	L00009	1975-05-17	225	15:02:56.801	-25:11:45.58	15:15:12		2AO-	120.0	U1-2		N	TAKASE,MAEHARA	
10	<input type="checkbox"/>	KSP00010	L00010	1975-05-22	225	18:22:54.510	-14:58:12.27	16:28:38		2AO-	120.0	U1-2		N	ISHIDA,MIYAMOTO	
11	<input type="checkbox"/>	KSP00011	S00011	1975-05-25	117	18:07:15.859	+36:00:14.75	14:19:24		1-N-	65.0	69-2		N	ISHIDA K,HAMAJIMA K	
12	<input type="checkbox"/>	KSP00012	S00012	1975-05-27	117	14:51:14.008	+65:46:58.29	12:20:32		1-N-	64.3	69-2		N	OHASHI M,SOYANO T	
13	<input type="checkbox"/>	KSP00013	L00013	1975-06-03	230	18:22:54.407	-14:58:12.33	15:50:00		2AO-	15.0	38-2		N	ISHIDA K,AOKI T	
14	<input type="checkbox"/>	KSP00014	L00014	1975-06-03	230	18:22:54.407	-14:58:12.33	16:19:35		1AD-	10.9	49-1		N	ISHIDA K,AOKI T	
15	<input type="checkbox"/>	KSP00015	L00015	1975-06-08	230	13:00:17.080	+27:58:04.59	11:24:14		3AJ-	119.9	45-2		N	TAKASE,SOYANO	
16	<input type="checkbox"/>	KSP00016	L00016	1975-06-08	230	13:00:17.080	+27:58:04.59	13:58:02		2AO-	15.2	NONE		N	TAKASE,SOYANO	

CONDITION	OBSERVER	More
N	ISHIDA,OHASHI,HAMAJIMA	
N	ISHIDA,HAMAJIMA	
N	ISHIDA,HAMAJIMA	
N	SOYANO,HAMAJIMA	
N	ISHIDA,HAMAJIMA,SOYANO	
N	ISHIDA,OHASHI	
N	ISHIDA,OHASHI	
N	TAKASE,MAEHARA	
N	TAKASE,MAEHARA	
N	ISHIDA,MIYAMOTO	
N	ISHIDA K,HAMAJIMA K	
N	OHASHI M,SOYANO T	
N	ISHIDA K,AOKI T	
N	ISHIDA K,AOKI T	
N	TAKASE,SOYANO	
N	TAKASE,SOYANO	

t Plate
Search

No. FITS用
チェック
ボックス

フレーム
ID

プレート
名

観測日

ファイル
サイズ

赤経

赤緯

UT

プリズム

乳剤

積分時間

フィルター

品質

乾板の状態

観測者

公開システムについて

Kiso Schmidt Plate Digital Arch

https://du02.dc.nao.ac.jp/KSPsearch

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A link of "No." column will lead you to the detailed information of corresponding plate. You can see the header information if exist.

No.	FITS	FRAME_ID	PLATEID	DATE_OBS	FITS_SIZE	RA
1	<input type="checkbox"/>	KSP00001	S00001	1975-04-25	117	14:21:
2	<input type="checkbox"/>	KSP00002	L00002	1975-04-30	225	14:41:
3	<input type="checkbox"/>	KSP00003	S00003	1975-04-30	119	13:22:
4	<input type="checkbox"/>	KSP00004	L00004	1975-05-06	225	14:42:
5	<input type="checkbox"/>	KSP00005	L00005	1975-05-07	225	13:22:
6	<input type="checkbox"/>	KSP00006	L00006	1975-05-12	225	13:22:
7	<input type="checkbox"/>	KSP00007	L00007	1975-05-12	225	13:22:
8	<input type="checkbox"/>	KSP00008	L00008	1975-05-17	225	15:02:
9	<input type="checkbox"/>	KSP00009	L00009	1975-05-17	225	15:02:
10	<input type="checkbox"/>	KSP00010	L00010	1975-05-22	225	18:22:
11	<input type="checkbox"/>	KSP00011	S00011	1975-05-25	117	18:07:
12	<input type="checkbox"/>	KSP00012	S00012	1975-05-27	117	14:51:
13	<input type="checkbox"/>	KSP00013	L00013	1975-06-03	230	18:22:
14	<input type="checkbox"/>	KSP00014	L00014	1975-06-03	230	18:22:
15	<input type="checkbox"/>	KSP00015	L00015	1975-06-08	230	13:00:
16	<input type="checkbox"/>	KSP00016	L00016	1975-06-08	230	13:00:

No.3834
KSP03834
No thumbnail.

No.3860
KSP03860
No thumbnail.

No.3869
KSP03869
No thumbnail.

No. FITS用
チェック フレーム プレート 観測日 ファイル
ボックス ID 名 日 サイズ 赤

SAOImage ds9

File Edit View Frame Bin Zoom Scale Color Region WCS Analysis Help

File

Object

Value 185

fk5 α 3:45:20.7114 δ +24:23:48.101

Physical X 5824.5976 Y 6346.0238

Image X 5824.5976 Y 6346.0238

Frame 1 x 0.0252146 0 -

file edit view frame bin zoom scale color region wcs analysis help

zoom in zoom out zoom fit zoom 1/4 zoom 1/2 zoom 1 zoom 2 zoom 4

1.4e+002 1.5e+002 1.6e+002 1.8e+002 1.9e+002 2e+002 2.1e+002 2.2e+002 2.3e+002

Kiso Schmidt Plate Digital Arch: X

https://du02.dc.nao.ac.jp/datareq/

Data Request Form

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

need data compression, select compression type.
: your purpose why you request the following data.
"Search for Calibration Frames" if you want to search calibration frames.
push "OK" button at the bottom of the page.

Note: Compress each FITS file with GZIP or [FITS](#) format.
FITS files except BITPIX=8, 16, and 32 are **NOT compressed with FPACK** because they are out of support.

Warning: Collect all FITS files into one file with ZIP or TAR format.
or TAR processing is ignored when a total amount of data by a single request exceeds than 100GB.

Account

(total of requested frames (approximately) 734,952,960

File type FTP

Compression (*) *2)

	No Compression	GZIP(.gz)	FPACK(.fz)
No Collection	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
ZIP (.zip)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TAR (.tar.gz)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use Research(palaves)

Number of requested frames 3

Requested FrameID
KSP06946 1997-02-23
KSP06947 1997-02-23
KSP06948 1997-02-24

Do you OK?

Kiso Schmidt Plate Archive Search

【まとめ】

- **TIFFファイル、カタログ情報からFITSファイルを作成**
 - 各パラメータについては、多少補正する可能性あり
- **公開システム(テストバージョン)を作成**
 - TIFFファイルも公開要望あり
 - Name Resolver 機能の要望あり
 - 位置較正するかどうか
 - 写野を考慮した検索は?

【今後】

- **ドキュメントの整備**
 - 木曾観測所の方々を中心に整えていく
 - シュミット望遠鏡の説明
 - 写真乾板(乳剤, 波長域, ...)の説明
 - ウエッジのデータ
 - スキャンの説明

木曾シュミットシンポジウム2019

木曾シュミット乾板のデジタル化

公開システムの開発

まとめと今後

ご意見・ご指摘・ご要望お待ちしております