



*Chandra X-ray Observatory*



*Kavli  
Inst.*

*TGCat*

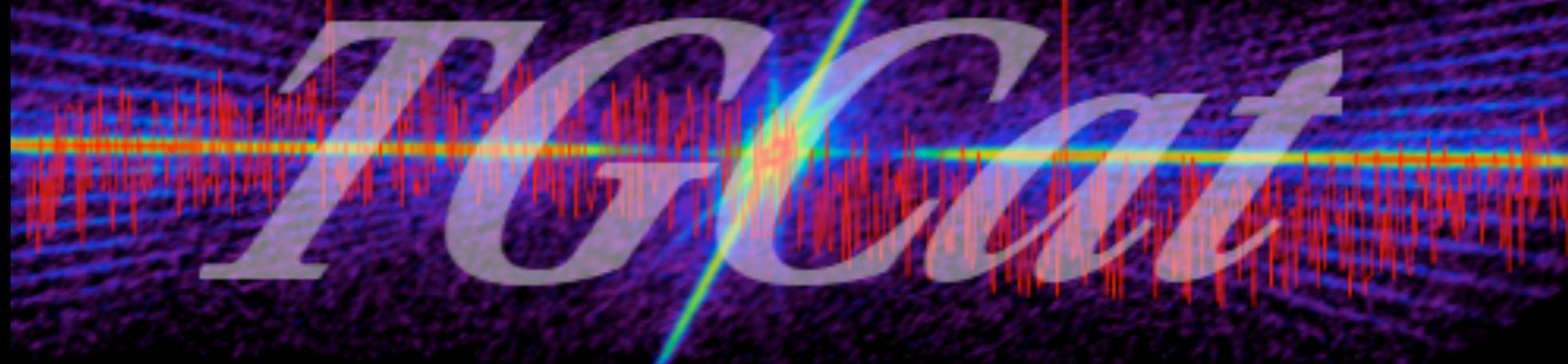
*Transmission Grating Catalog  
and Archive*



Mel Nynka

MIT Kavli Institute + Chandra X-ray Center



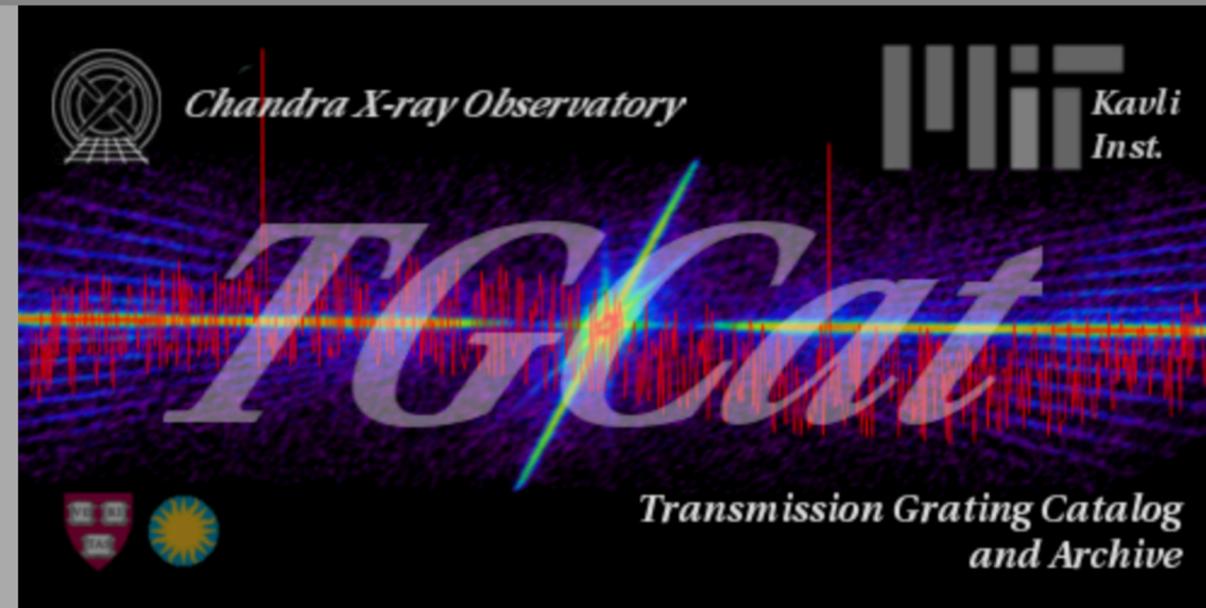


## Quick at-a-glance overview of Chandra Gratings observations

- Good starting point for analysis
  - HETG, LETG, with ACIS or HRC detectors
1. How can you search TGCat?
  2. Single Observation - search with ObsID
    - Canned analysis plots
    - Interactive plotting
  3. Multiple Observations
    - Plotting variability
  4. TGCat Help

# Start your (search) engines!

Start Here. Select functionality from menu items



[TGCat Announcements \[all\]](#)

---

[Serendipitous Source Extraction Request Form](#)

---

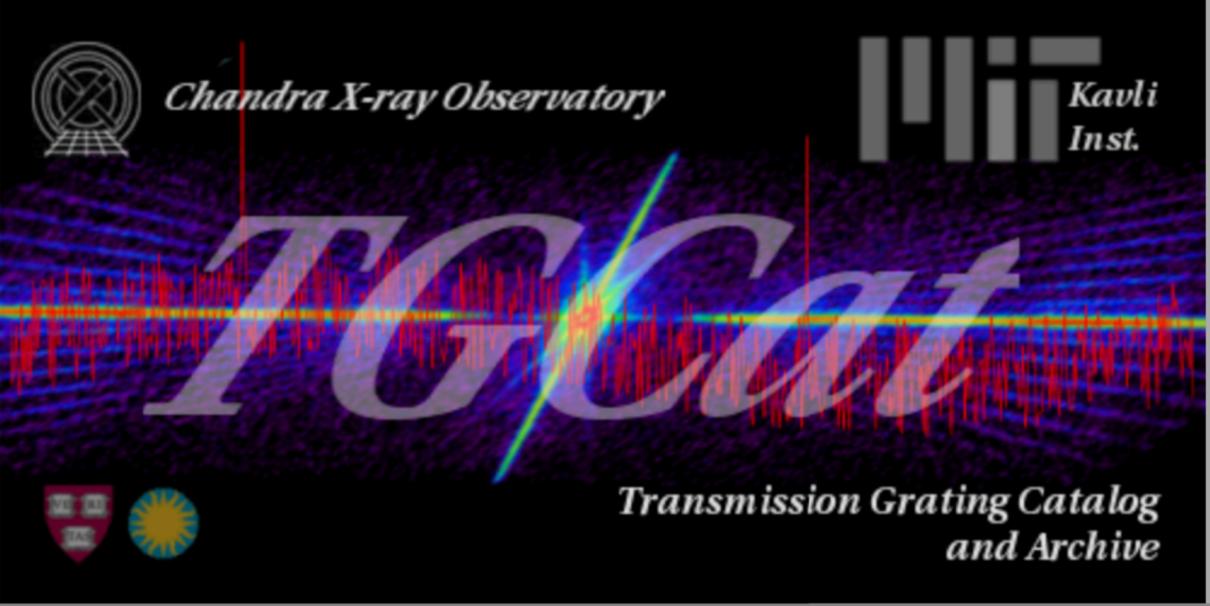
If you use **TGCat** in your research, please cite: [Huenemoerder et al. 2011 \(AJ, 141, 129\)](#).

# Start your (search) engines!

TGCat	Query	Quick Search	Help Topics	Help
-------	-------	--------------	-------------	------

- Name
- Cone Search
- Type Select
- Spectral Properties
- Obsid
- Arbitrary Extraction Column
- Arbitrary Source Column
- 
- Latest Query Results
- My Recent Queries

Start Here  
functionality from  
menu items



[\*TGCat Announcements \[all\]\*](#)

---

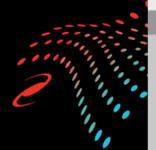
[\*Serendipitous Source Extraction Request Form\*](#)

---

If you use **TGCat** in your research, please cite: [Huenemoerder et al. 2011 \(AJ, 141, 129\)](#).



Related Catalog Projects:  
BiRD CSC MAST



# Start your (search) engines!

TGCat Query Quick Search Help Topics Help

Name  
Cone Search  
Type Select  
Spectral Properties  
Obsid  
Arbitrary Extraction Column  
Arbitrary Source Column  
-----  
Latest Query Results  
My Recent Queries

## Type Search

Select one or multiple object types to search for. Hold Control/Shift to select multiple in a single menu. The numbers beside the types indicate how many objects in the TGCat catalog are assigned to that type ( not only primary type )

Candidate ( 76 )	Composite ( 282 )	Galaxy ( 111 )	Nebula ( 39 )
(23) Black Hole Candid	(3) Cataclysmic Var. A...	(1) Absorption Line sy	(1) Dark Cloud (nebula
(3) Cataclysmic Binary...	(8) Cataclysmic Var. D...	(80) Active Galaxy Nuc	(11) Emission Object
(1) High-Mass X-ray bi...	(7) Cataclysmic Variab...	(12) BL Lac - type obj	(3) Herbig-Haro Object
(43) Neutron Star Cand	(4) Cluster of Galaxie	(21) Blazar	(4) HI (neutral) regio
(1) Possible Carbon St	(2) Cluster of Stars	(6) Emission-line gala	(10) HII (ionized) reg
(1) Possible Cluster o...	(81) Double or multipl...	(101) Galaxy	(9) Planetary Nebula

Star ( 364 )	Wavelength ( 492 )
(1) Asymptotic Giant B...	(15) Blue object
(14) Be Star	(2) centimetric Radio-...
(80) Emission-line Sta	(10) gamma-ray Burst
(3) Eruptive variable	(204) gamma-ray source
(1) Extra-solar Planet...	(294) Infra-Red source
(15) Flare Star	(2) Maser

To search for all objects matching ALL selected types, please choose "Exclusive"  
To search for all objects matching ONE or MORE selected types, please choose "Inclusive"  
To search for all objects whose primary type match ANY selected, please choose "Primary Type"

Search Type:  Exclusive  Inclusive  Primary Type

Submit Query Reset

*TGCat Announcements [all]*  
*Serendipitous Source Extraction Request Fo*  
If you u

MIT KAVLI INSTITUTE  
ISIS CIAO  
Powered by MySQL  
php

# Start your (search) engines!

TGCat Query Quick Search Help Topics Help

Name  
Cone Search  
Type Select  
Spectral Properties  
Obsid  
Arbitrary Extraction Column  
Arbitrary Source Column  
-----  
Latest Query Results  
My Recent Queries

**Start Here**  
functionality from  
menu items

## Obsid Search

Search by *Chandra* ObsID. List an arbitrary number of ObsIDs in the box separated by a ",", newlines, or spaces. The wildcard character "%" will match zero or more digits, and "\_" will match any single digit.

Obsid(s):

file listing one obsid per line can be used in addition to the above input field. Wildcards may be used as well

Obsid File:  No file selected.

Limit the type of observation below

ACIS-S  HRC-S  HETG  LETG

[TGCat Announcements \[all\]](#)

[Serendipitous Source Extraction Request Form](#)

If you u



MIT KAVLI  
INSTITUTE

ISIS

CIAO

Powered by  
MySQL

php

Related Catalog Projects:  
BiRD CSC MAST

NVO SCSSIA



# Start your (search) engines!

TGCat Query Quick Search Help Topics Help

Name  
Cone Search  
Type Select  
Spectral Properties  
Obsid  
Arbitrary Extraction Column  
Arbitrary Source Column  
-----  
Latest Query Results  
My Recent Queries

**Start Here**  
functionality from  
menu items

## Name Search

Search by object name. Identifier name is case insensitive. when not using SIMBAD, only the official tgcate object keyword is matched (spaces are compacted automatically). Wildcard % matches *zero* or more occurrences of any character

Target list

A file containing one target per line can be searched in addition to the above input field

Target File:  No file selected.

Simbad can be use to resolve the above targets to coordinates for a more flexible matching. Please note that using wildcards in a simbad search may take some time

Use SIMBAD?  rad:  Radius Units:

If no exact match is found, but close matches are detected, these will be displayed instead.

Turn this option off?

*TGCat Announcements [all]*

*Serendipitous Source Extraction Request For*

If you u

MIT KAVLI INSTITUTE  
ISIS CIAO  
Powered by MySQL  
php

# Start your (search) engines!

TGCat Query Quick Search Help Topics Help

Name  
Cone Search  
Type Select  
Spectral Properties  
Obsid  
Arbitrary Extraction Column  
Arbitrary Source Column  
-----  
Latest Query Results  
My Recent Queries

**Start Here**  
functionality from  
menu items

## Name Search

Search by object name. Identifier name is case insensitive. when not using SIMBAD, only the official tgcath object keyword is matched (spaces are compacted automatically). Wildcard % matches zero or more occurrences of any character

Target list

0614

A file containing one target per line can be searched in addition to the above input field

Target File:  No file selected.

Simbad can be used to resolve the above targets to coordinates for a more flexible matching. Please note that using wildcards in a simbad search may take some time

Use SIMBAD?  rad:  Radius Units:

If no exact match is found, but close matches are detected, these will be displayed instead.

Turn this option off?

*TGCat Announcements [all]*

*Serendipitous Source Extraction Request Form*

If you use

MIT KAVLI INSTITUTE  
ISIS CIAO  
Powered by MySQL  
php

# Name Search: 4U 0614+091

TGCat	Query	View	Actions	Help Topics					Help
<i>---- currently viewing source table ----</i>									
+/-	Links	object	simbad_ID	ra (h:m:s)	decl (d:m:s)	pType	other_types	num_extractions	
<input type="checkbox"/>	<b>sdbi</b>	4U 0614+091	V* V1055 Ori	06:17:07.373	+09:08:13.524	LXB	gam, LXB, N*?, V*, X	5	



TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input type="checkbox"/>	<b>opvs</b>	100	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.632	1999-11-28 22:26:07	26126.1	
<input type="checkbox"/>	<b>opvs</b>	10759	4U 0614+091	ACIS	HETG	06:17:07.363	+09:08:13.488	2009-01-24 05:07:34	59678.4	
<input type="checkbox"/>	<b>opvs</b>	10760	4U 0614+091	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-18 23:07:34	44687.8	
<input type="checkbox"/>	<b>opvs</b>	10858	4U 0614+091	ACIS	HETG	06:17:07.358	+09:08:13.524	2009-01-19 17:45:01	34436.8	
<input type="checkbox"/>	<b>opvs</b>	10857	4U 0614+091	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-21 13:49:21	58053.2	

Provides a quick snapshot of the observations

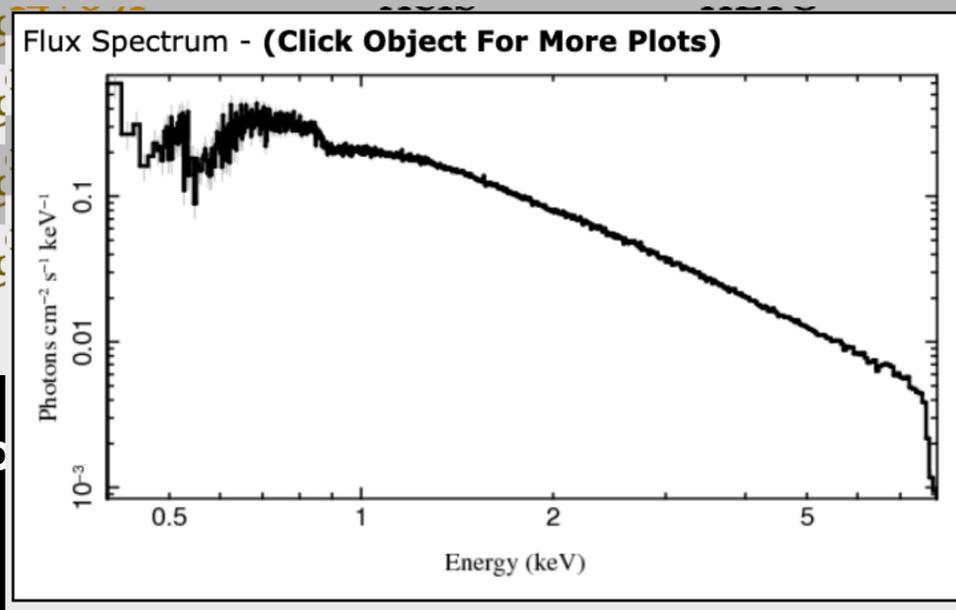


# Name Search: 4U 0614+091

TGCat	Query	View	Actions	Help Topics					Help
<i>---- currently viewing source table ----</i>									
+/-	Links	object	simbad_ID	ra (h:m:s)	decl (d:m:s)	pType	other_types	num_extractions	
<input type="checkbox"/>	<a href="#">sdbi</a>	4U 0614+091	V* V1055 Ori	06:17:07.373	+09:08:13.524	LXB	gam, LXB, N*?, V*, X	5	



TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input type="checkbox"/>	<a href="#">opvs</a>	100	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.632	1999-11-28 22:26:07	26126.1	
<input type="checkbox"/>	<a href="#">opvs</a>	10759	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.488	2009-01-24 05:07:34	59678.4	
<input type="checkbox"/>	<a href="#">opvs</a>	10760	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.524	2009-01-18 23:07:34	44687.8	
<input type="checkbox"/>	<a href="#">opvs</a>	10858	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.524	2009-01-19 17:45:01	34436.8	
<input type="checkbox"/>	<a href="#">opvs</a>	10857	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.524	2009-01-21 13:49:21	58053.2	



observations



# Name Search: 4U 0614+091

TGCat	Query	View	Actions	Help Topics					Help
<i>---- currently viewing source table ----</i>									
+/-	Links	object	simbad_ID	ra (h:m:s)	decl (d:m:s)	pType	other_types	num_extractions	
<input type="checkbox"/>	<b>sdbi</b>	4U 0614+091	V* V1055 Ori	06:17:07.373	+09:08:13.524	LXB	gam, LXB, N*?, V*, X	5	



TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input type="checkbox"/>	<b>opvs</b>	100	4U 0614+091	HRC	LETG	06:17:07.414	+09:08:13.632	1999-11-28 22:26:07	26126.1	
<input type="checkbox"/>	<b>opvs</b>	10759	4U 0614+091	ACIS	HETG	06:17:07.363	+09:08:13.488	2009-01-24 05:07:34	59678.4	
<input type="checkbox"/>	<b>opvs</b>	10760	4U 0614+091	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-18 23:07:34	44687.8	
<input type="checkbox"/>	<b>opvs</b>	10858	4U 0614+091	ACIS	HETG	06:17:07.358	+09:08:13.524	2009-01-19 17:45:01	34436.8	
<input type="checkbox"/>	<b>opvs</b>	10857	4U 0614+091	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-21 13:49:21	58053.2	

Let's look at one of the observations



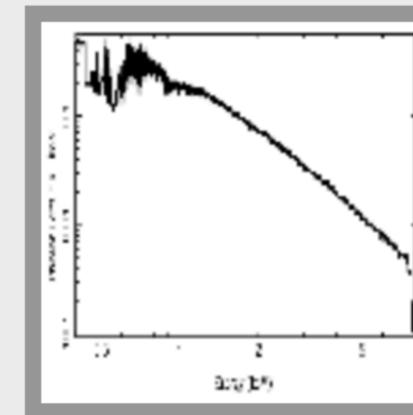
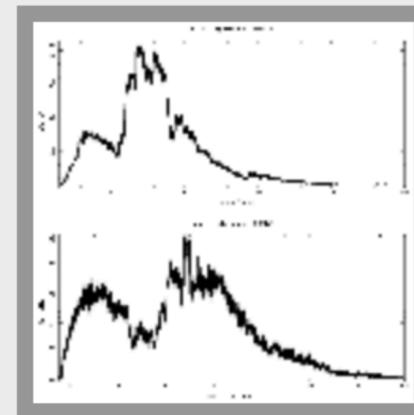
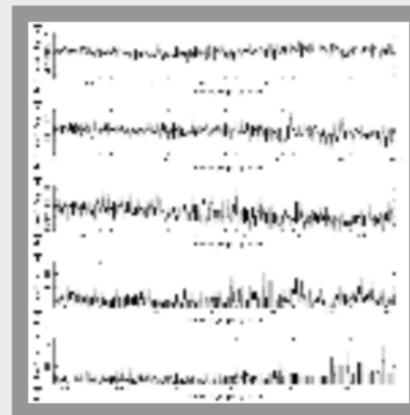
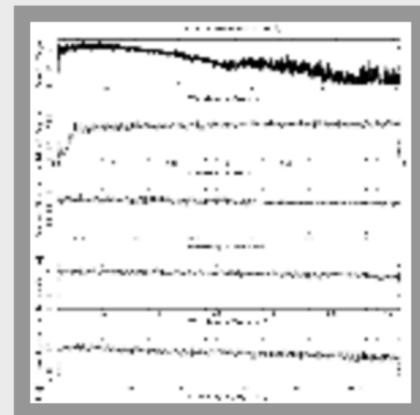
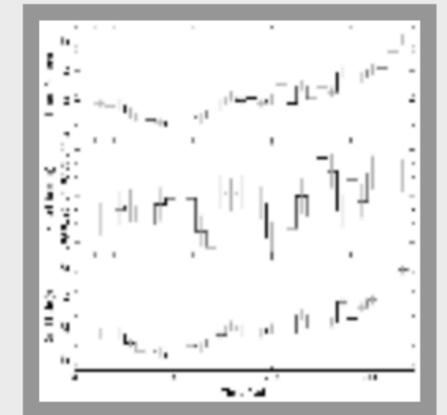
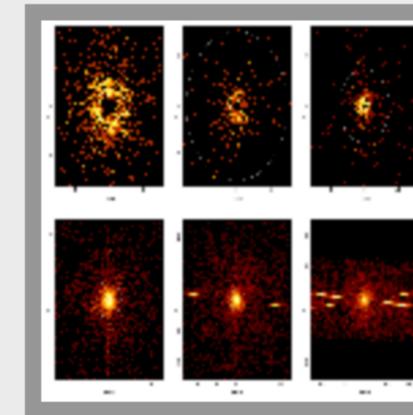
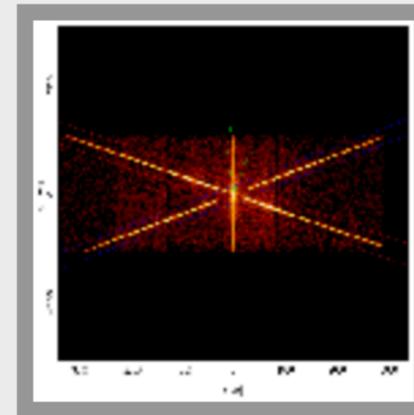
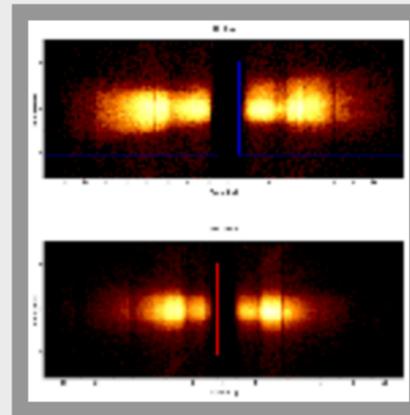
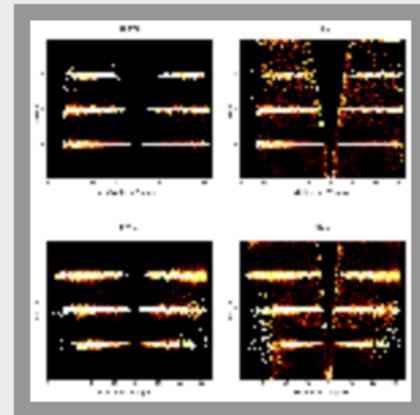
# ObsID 10858 - Static images

[TGCat](#)[Query](#)[View](#)[Help Topics](#)[Help](#)

## 4U 0614+091

### single extraction product

id	4244
srcid	1719
obsid	<a href="#">10858</a>
review	<a href="#">good</a>
obi	0
target	4U 0614+091
object	4U 0614+091
simbad_ID	<a href="#">V* V1055 Ori</a>
instrument	ACIS
grating	HETG
exposure(s)	3.44e+4
ra	94.28066
decl	9.13709
heg_band(c/s)	2.17e+1
meg_band(c/s)	2.22e+1
leg_band(c/s)	2.21e+1
letg_acis_band(c/s)	2.21e+1
zero_order(c/s)	1.01e+0
readmode	TIMED
datamode	FAINT
proc_date	2012-02-05 04:13:16
zo_method	findzo
date_obs	2009-01-19 17:45:01



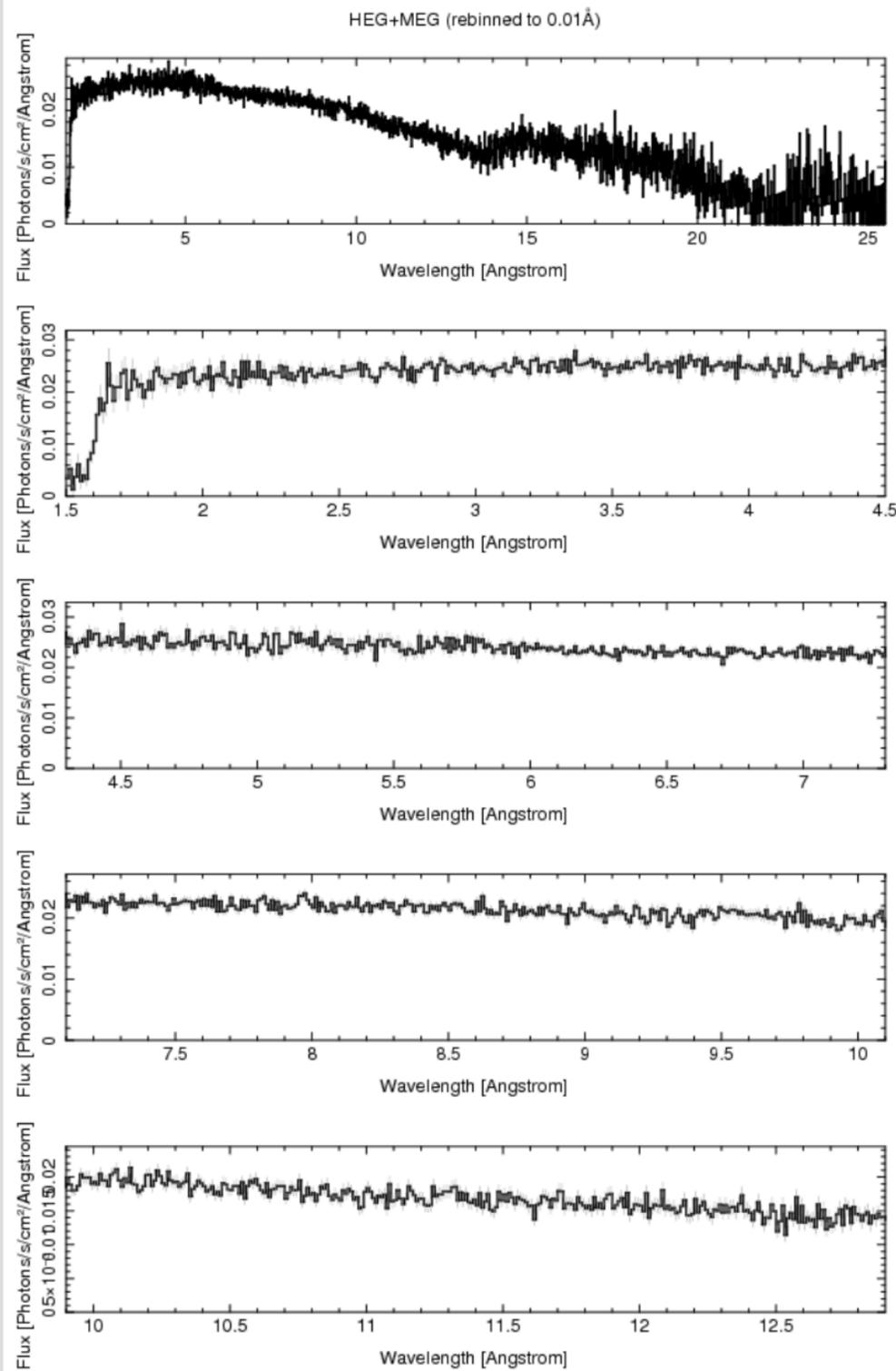
# Detailed spectrum

# Broad view spectrum

close

description

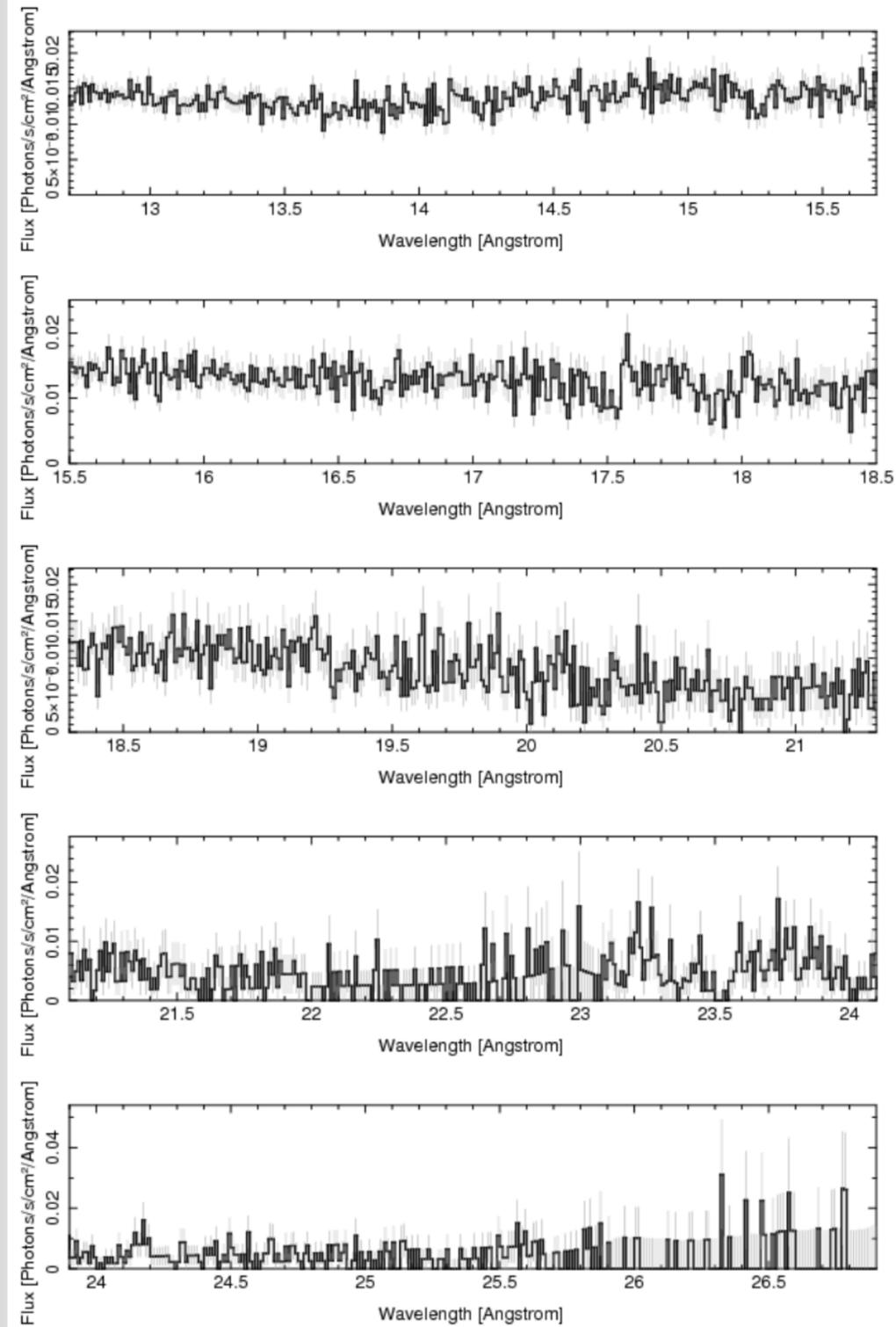
full size



close

description

full size

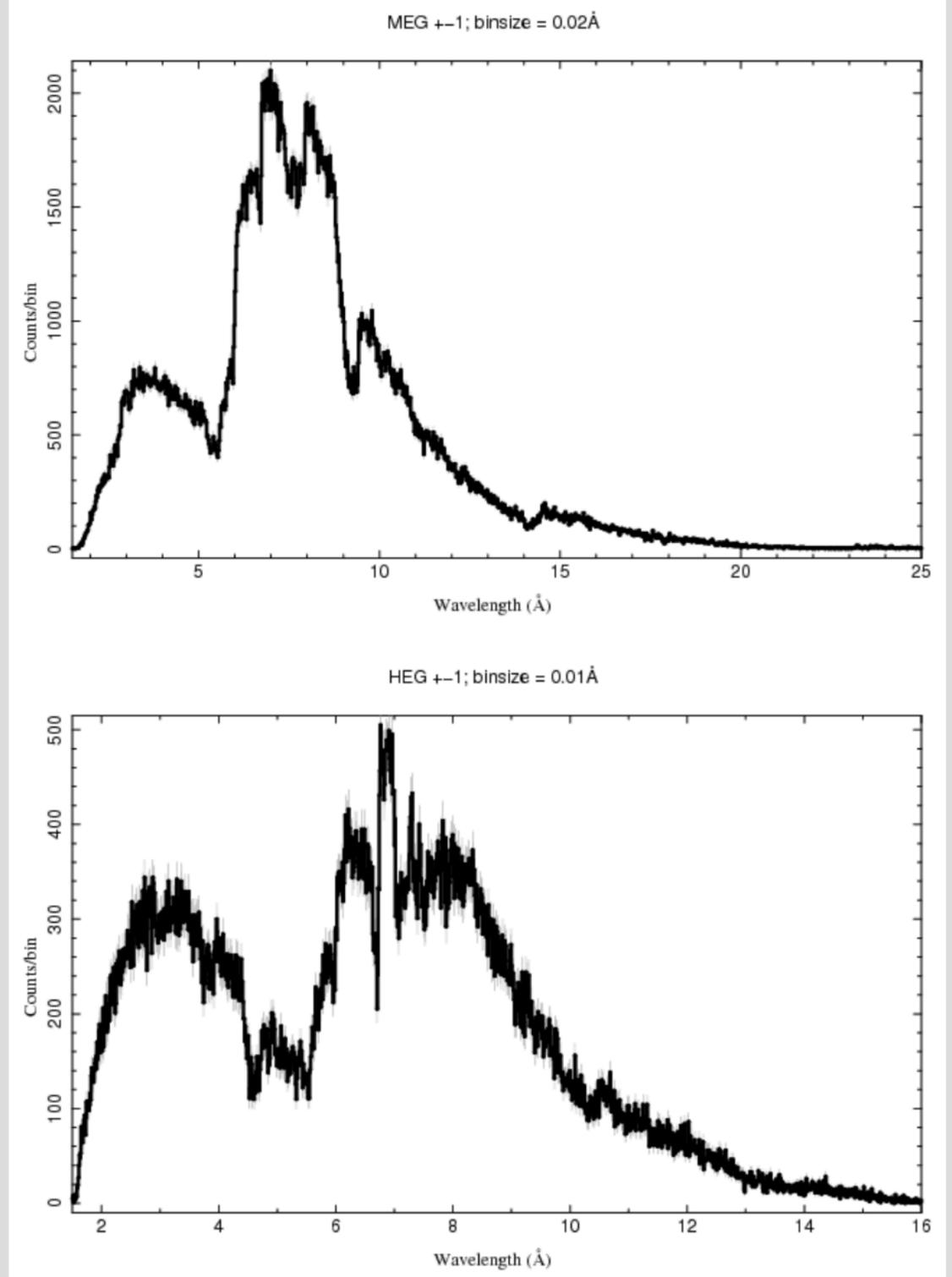


S

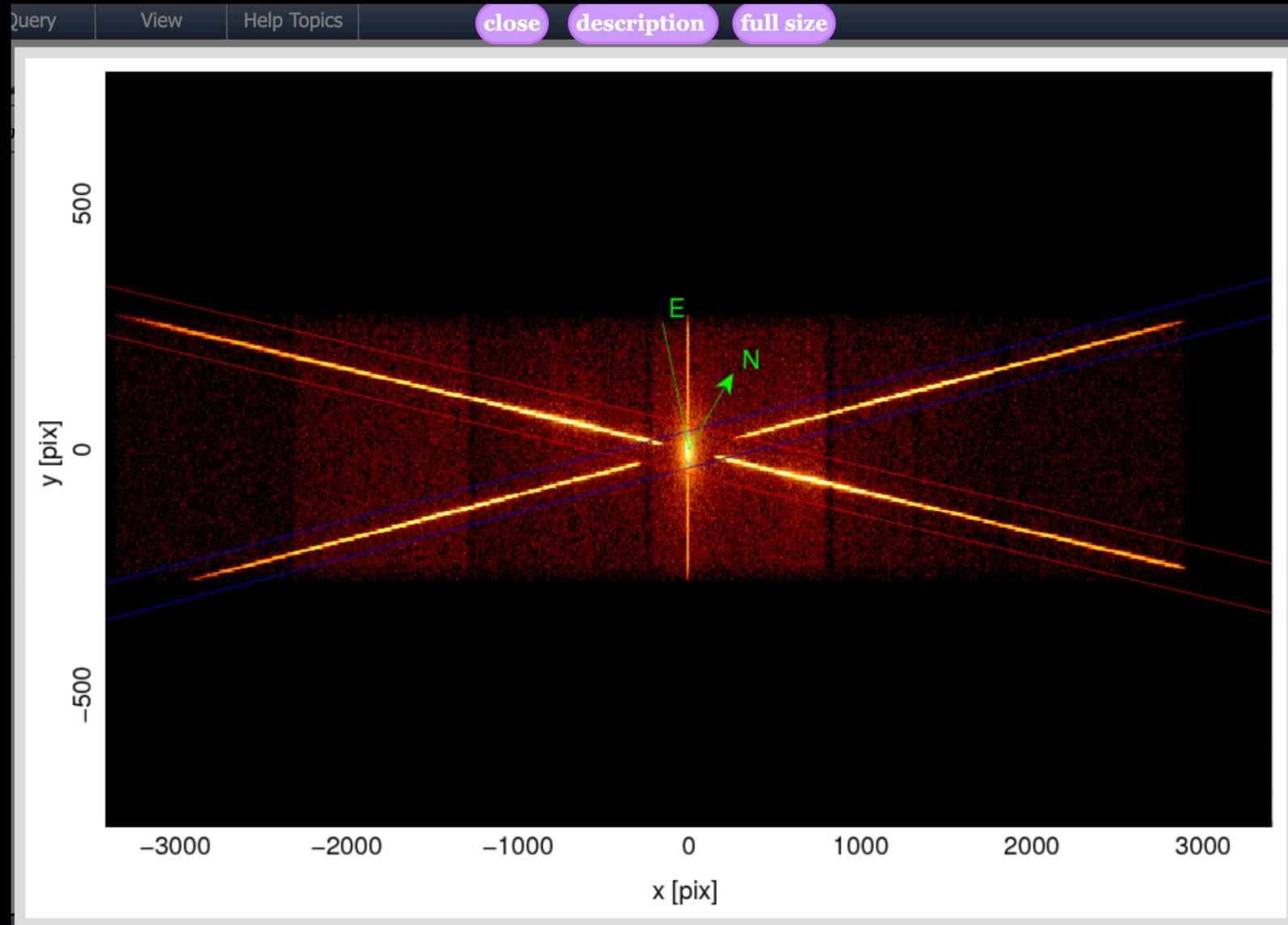
close

description

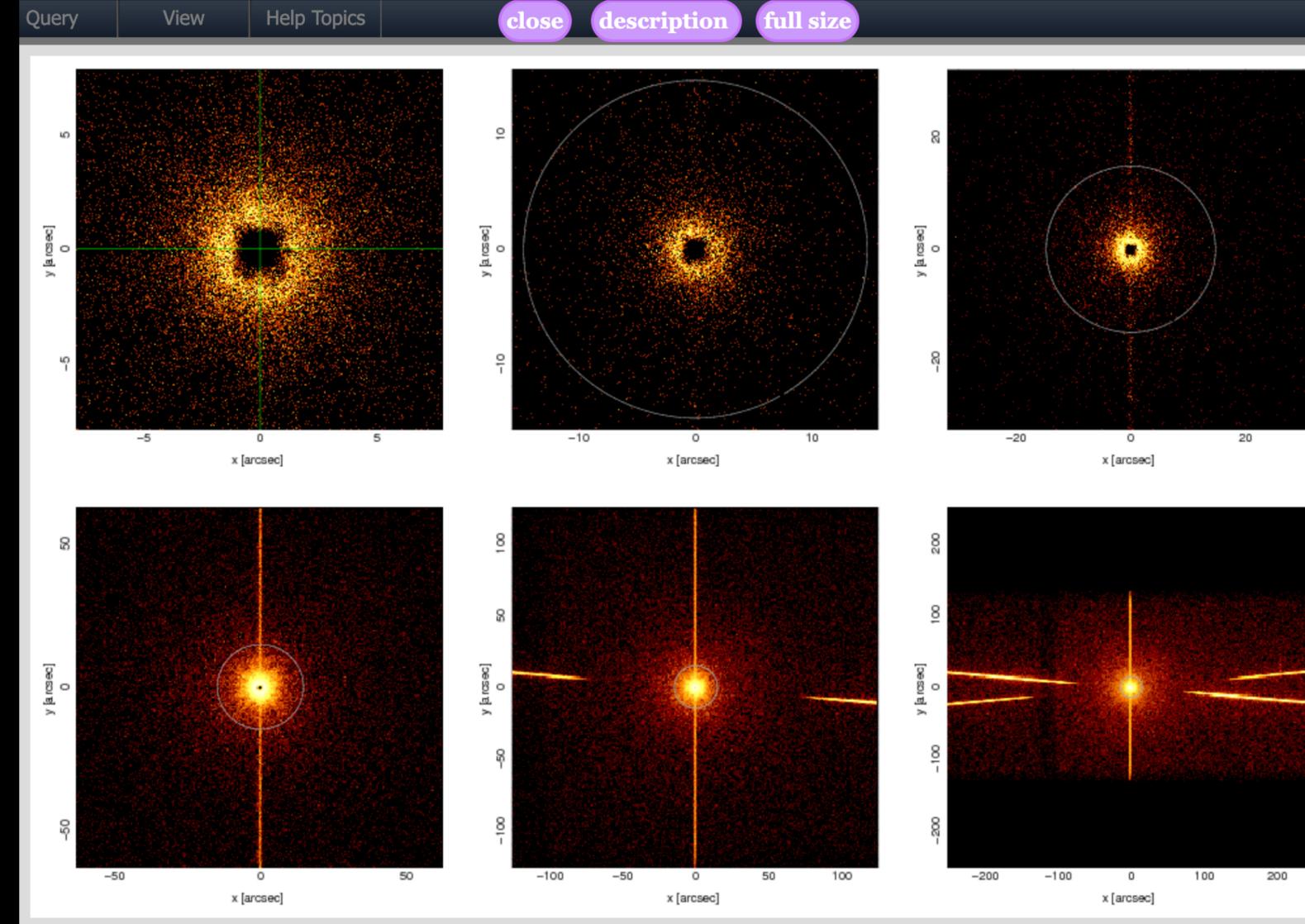
full size



# Full detector image



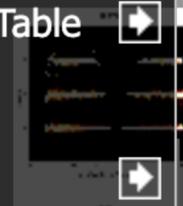
# Close view of target



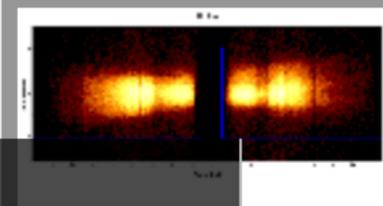
# ObsID 10858 - Interactive Plotting

TGCat	Query	View	Help Topics	Help
<b>4U 0614+091</b>		Preview Gallery		
<i>single extraction product</i>		File Table		
		Spectral Properties Table		
		VV Report		
		Custom Plotting		
<b>id</b>	4244			
<b>srcid</b>	1719			
<b>obsid</b>	<a href="#">10858</a>			
<b>review</b>	<a href="#">good</a>			
<b>obi</b>	0			
<b>target</b>	4U 0614+091			
<b>object</b>	4U 0614+091			
<b>simbad_ID</b>	<a href="#">V* V1055 Ori</a>			
<b>instrument</b>	ACIS			
<b>grating</b>	HETG			
<b>exposure(s)</b>	3.44e+4			
<b>ra</b>	94.28066			
<b>decl</b>	9.13709			
<b>heg_band(c/s)</b>	2.17e+1			
<b>meg_band(c/s)</b>	2.22e+1			
<b>leg_band(c/s)</b>	2.21e+1			
<b>letg_acis_band(c/s)</b>	2.21e+1			
<b>zero_order(c/s)</b>	1.01e+0			
<b>readmode</b>	TIMED			
<b>datamode</b>	FAINT			
<b>proc_date</b>	2012-02-05 04:13:16			
<b>zo_method</b>	findzo			
<b>date_obs</b>	2009-01-19 17:45:01			

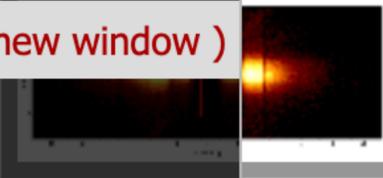
  



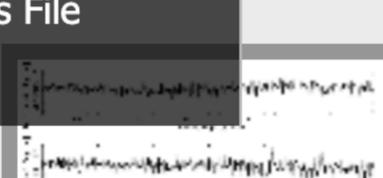
Open Plotter



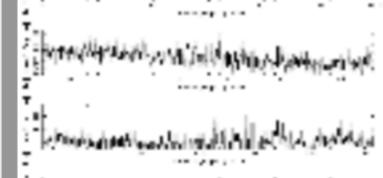
Open Plotter ( new window )



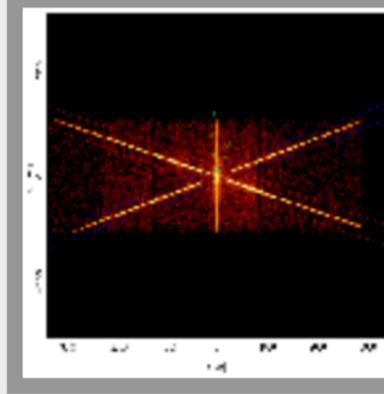
ASCII Dump

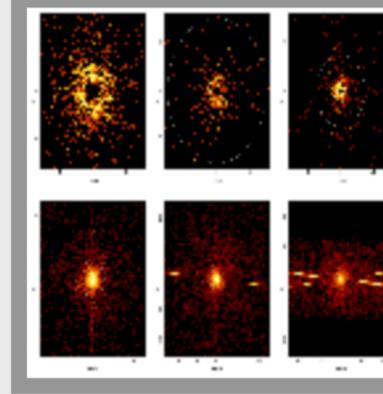


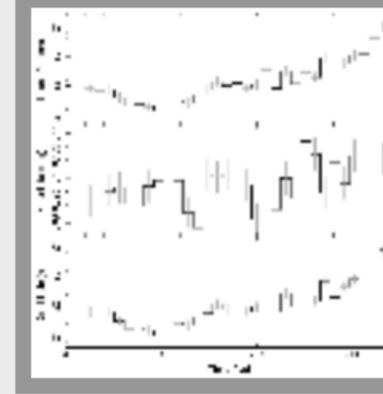
ISIS Commands File

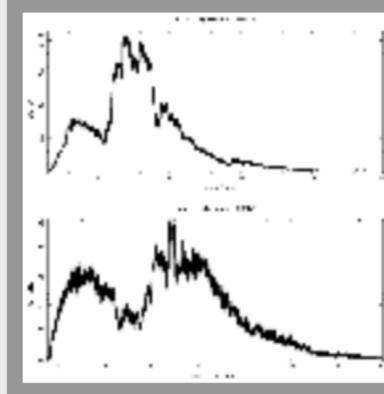


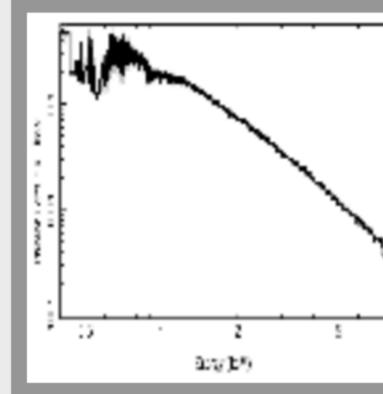
ISIS Error log











# ObsID 10858 - Interactive Plotting

Plot Type:  X-Units:  Y-Scale:

XLog  YLog  ErrorBars

MEG Orders:  +1  -1 HEG Orders:  +1  -1  Combine

Xmins:  Xmax:  Ymin:  Ymax:

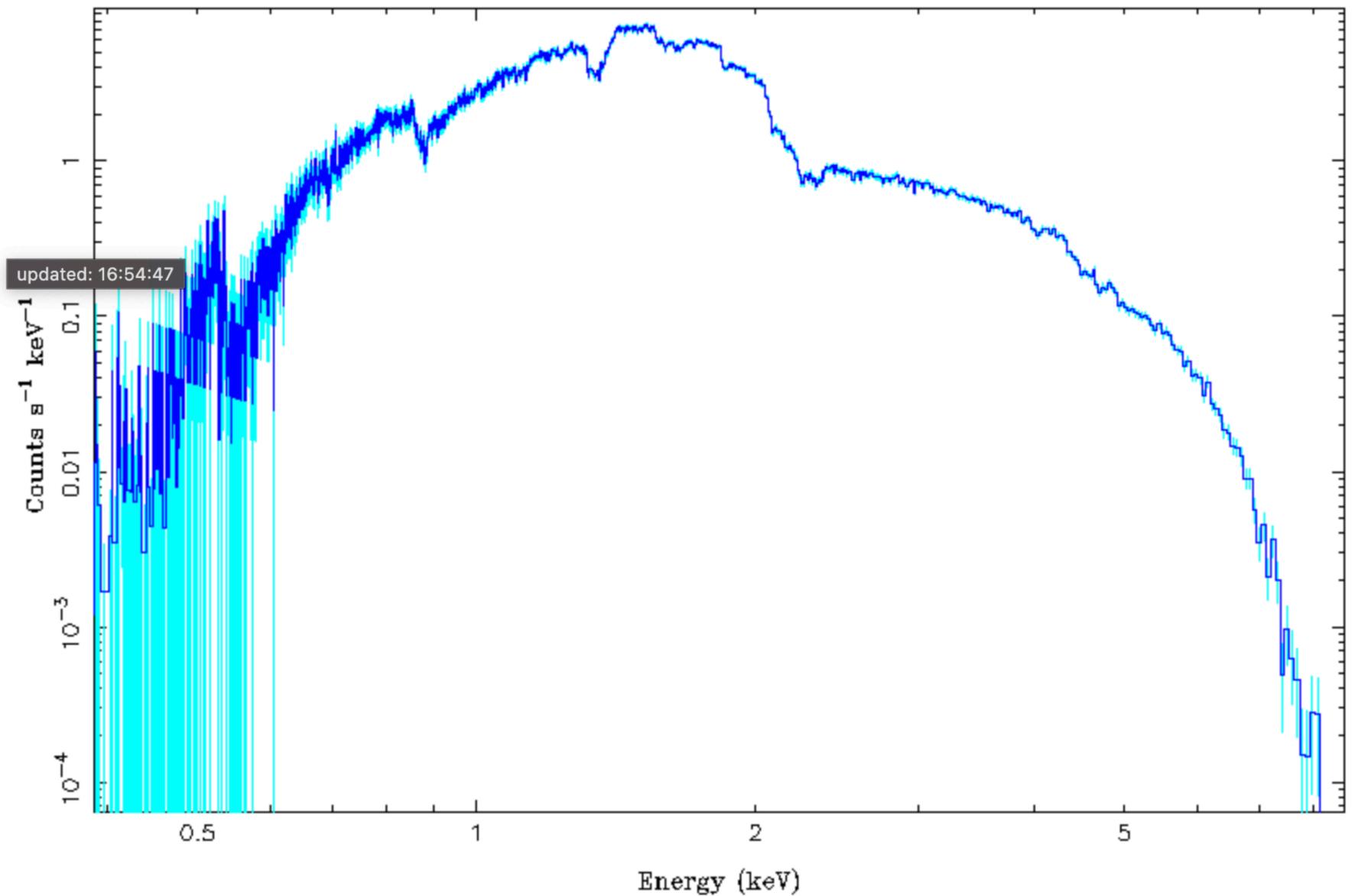
Bin  min-S/N:  min-Ch:

Mark feature locations:

Lines:  H-like  He-like  Fe

Redshift (applied to spectrum):  (v/c)

Save Current Parameters



# ObsID 10858 - Interactive Plotting

Plot Type:  X-Units:  Y-Scale:

XLog  YLog  ErrorBars

MEG Orders:  +1  -1 HEG Orders:  +1  -1  Combine

Xmins:  Xmax:  Ymin:  Ymax:

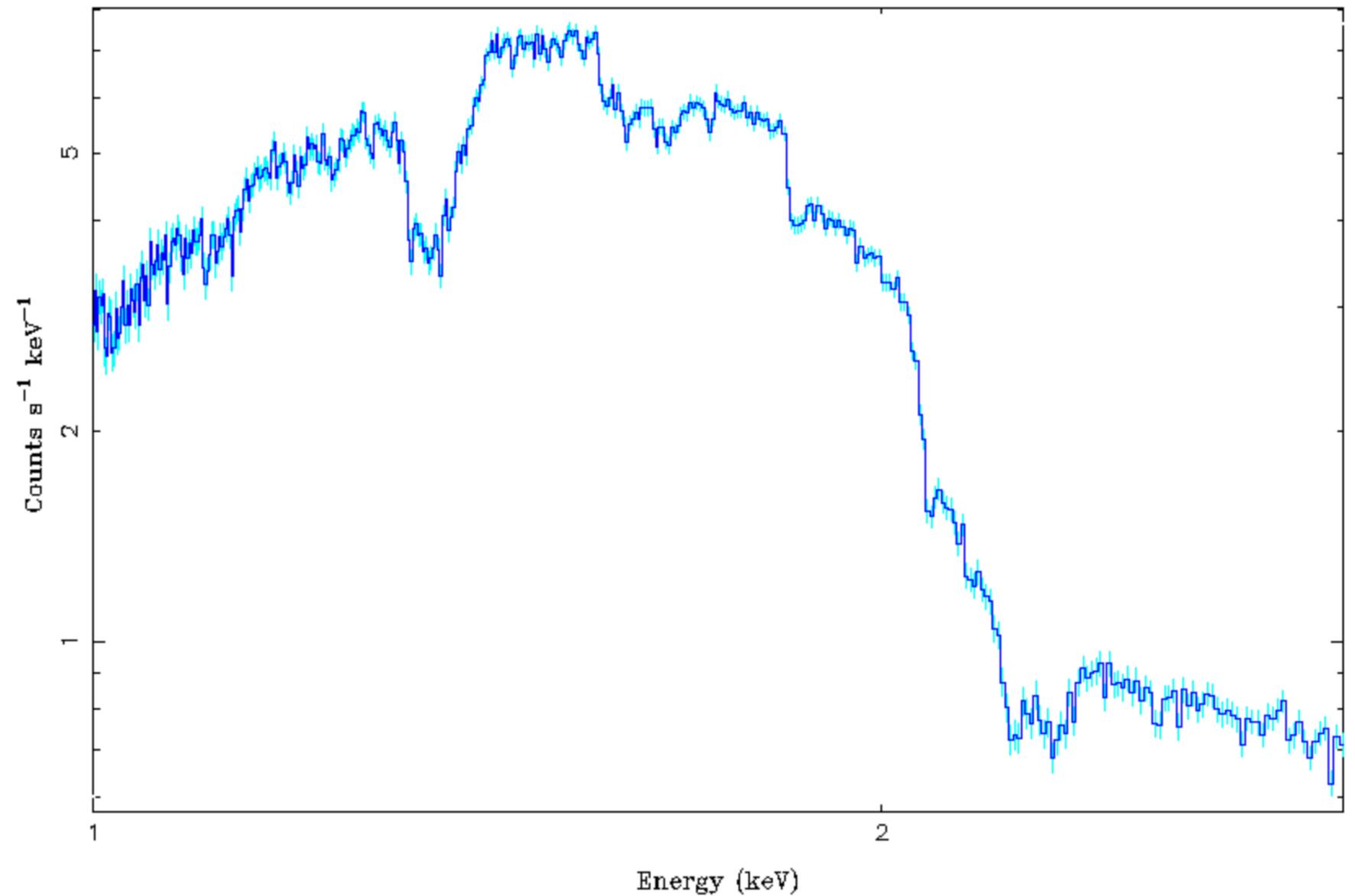
Bin  min-S/N:  min-Ch:

Mark feature locations:

Lines:  H-like  He-like  Fe

Redshift (applied to spectrum):  (v/c)

Save Current Parameters



# Interactive Plotting with multiple observations

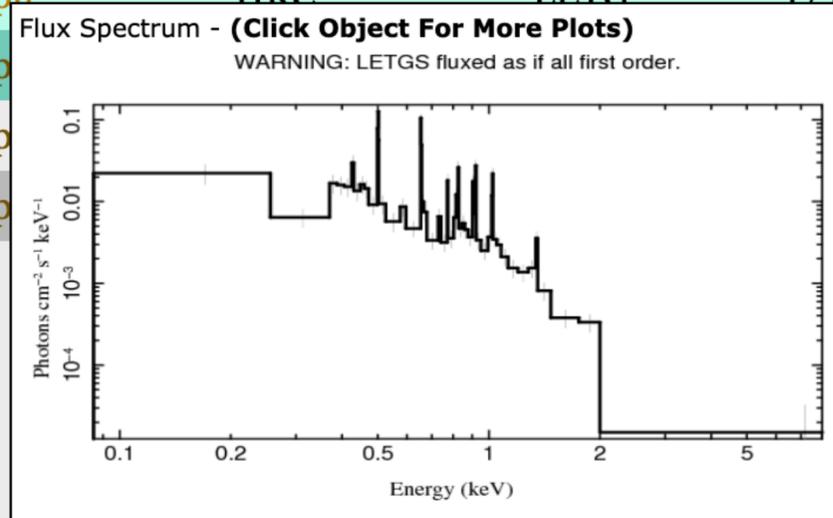
## Lets go back to our original search

TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input type="checkbox"/>	<a href="#">o p v s</a>	100	<a href="#">4U 0614+091</a>	HRC	LETG	06:17:07.414	+09:08:13.632	1999-11-28 22:26:07	26126.1	
<input type="checkbox"/>	<a href="#">o p v s</a>	10759	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.363	+09:08:13.488	2009-01-24 05:07:34	59678.4	
<input type="checkbox"/>	<a href="#">o p v s</a>	10760	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-18 23:07:34	44687.8	
<input type="checkbox"/>	<a href="#">o p v s</a>	10858	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.358	+09:08:13.524	2009-01-19 17:45:01	34436.8	
<input type="checkbox"/>	<a href="#">o p v s</a>	10857	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-21 13:49:21	58053.2	

# Interactive Plotting with multiple observations

## Search for RS Oph

TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input type="checkbox"/>	<a href="#">opvs</a>	7296	RS Oph	HRC	LETG	17:50:13.169	-06:42:28.872	2006-03-24 12:25:22	9970.33	
<input type="checkbox"/>	<a href="#">opvs</a>	7389	RS Oph	HRC	LETG	17:50:13.169	-06:42:28.296	2006-09-07 02:37:17	39890.9	
<input type="checkbox"/>	<a href="#">opvs</a>	7403	RS Oph	HRC	LETG	17:50:13.176	-06:42:28.188	2006-09-08 17:58:05	17922.8	
<input type="checkbox"/>	<a href="#">opvs</a>	7390	RS Oph	HRC	LETG	17:50:13.169	-06:42:28.224	2006-09-04 10:43:19	39682.2	
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	7298	RS Oph	HRC	LETG	17:50:13.176	-06:42:28.620	2006-06-04 12:05:59	19966.6	
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	7297	RS Oph	HRC	LETG	17:50:13.162	-06:42:28.728	2006-04-20 17:24:53	6523.94	
<input type="checkbox"/>	<a href="#">opvs</a>	7280	RS Oph	HRC	LETG	17:50:13.162	-06:42:28.620	2006-02-26 15:19:54	9917.4	
<input type="checkbox"/>	<a href="#">opvs</a>	23507	RS Oph	HRC	LETG	17:50:13.154	-06:42:29.088	2021-08-27 00:57:52	28497	



Notice the differences in spectra from 7298, 7292

# Interactive Plotting with multiple observations

## Search for RS Oph

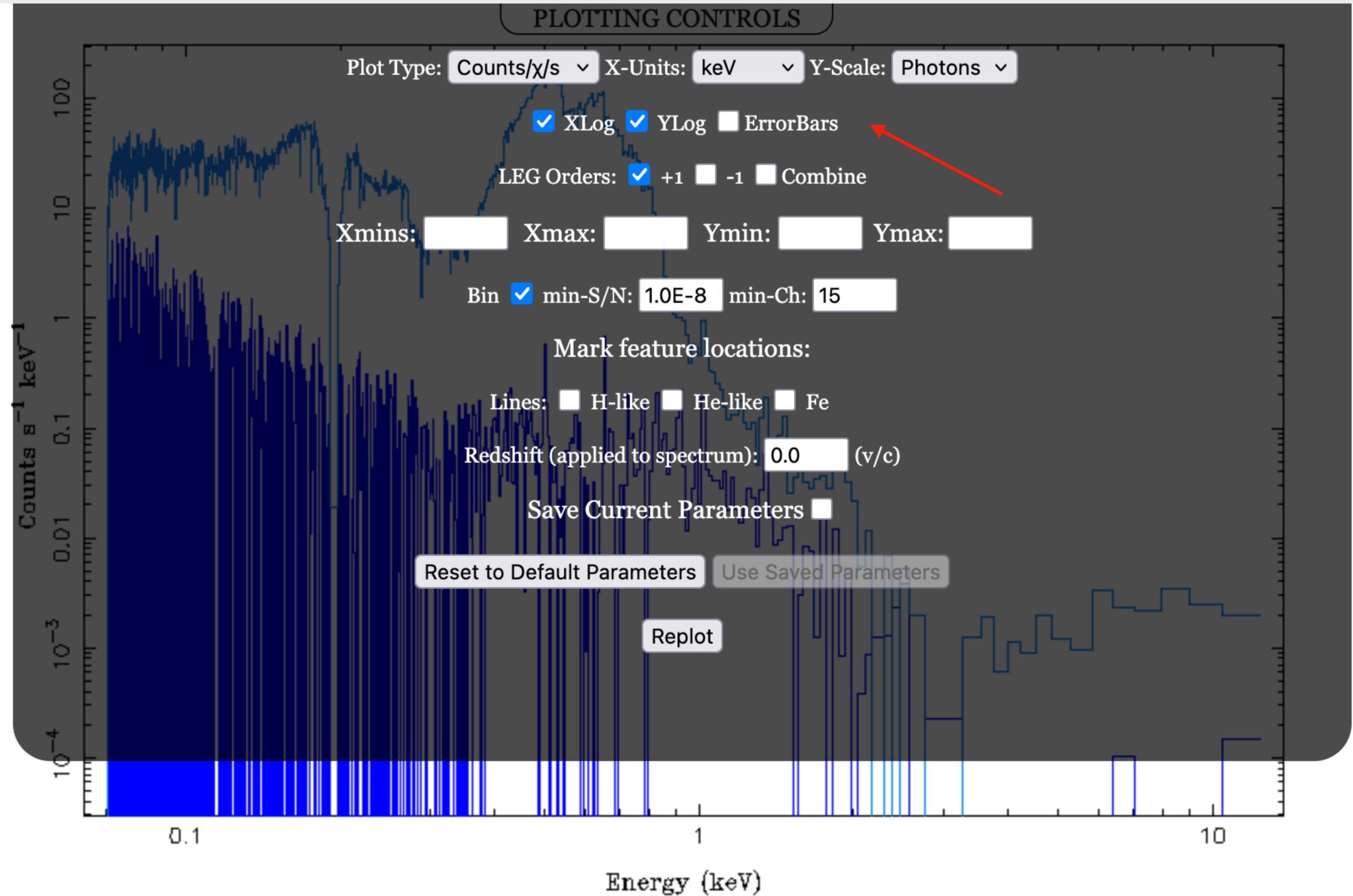
TGCat	Query	View	Actions	Help Topics						Help
			Limit	<i>---- currently viewing extractions table ----</i>						
+/-	Links	obsid	object	Download	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)
<input type="checkbox"/>	<a href="#">opvs</a>	7296	RS Oph	Go to Source Table	C	LETG	17:50:13.169	-06:42:28.872	2006-03-24 12:25:22	9970.33
<input type="checkbox"/>	<a href="#">opvs</a>	7389	RS Oph	Plot ( Combined )		LETG	17:50:13.169	-06:42:28.296	2006-09-07 02:37:17	39890.9
<input type="checkbox"/>	<a href="#">opvs</a>	7403	RS Oph	Plot ( Multiple )	HRC	LETG	17:50:13.176	-06:42:28.188	2006-09-08 17:58:05	17922.8
<input type="checkbox"/>	<a href="#">opvs</a>	7390	RS Oph	Filter results	HRC	LETG	17:50:13.169	-06:42:28.224	2006-09-04 10:43:19	39682.2
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	7298	RS Oph	Clear filters	HRC	LETG	17:50:13.176	-06:42:28.620	2006-06-04 12:05:59	19966.6
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	7297	RS Oph	Reset query	HRC	LETG	17:50:13.162	-06:42:28.728	2006-04-20 17:24:53	6523.94
<input type="checkbox"/>	<a href="#">opvs</a>	7280	RS Oph	Tag Query	ACIS	HETG	17:50:13.162	-06:42:28.620	2006-02-26 15:19:54	9917.4
<input type="checkbox"/>	<a href="#">opvs</a>	23507	RS Oph		ACIS	HETG	17:50:13.154	-06:42:29.088	2021-08-27 00:57:52	28497

Plot the two observations together

# Multi Preview

combined extraction product

object	Multi Preview
obsid	7298, 7297
ids	2527, 2528
srcids	1852
instruments	HRC
gratings	LETG
total_exposure(s)	2.65e+4
ra	267.55487
decl	-6.70797
heg_band(c/s)	4.68e-1
meg_band(c/s)	2.51e+1
leg_band(c/s)	3.89e+1
letg_acis_band(c/s)	3.46e+1
zeroth_order(c/s)	3.53e+1
proc_date	2010-02-23 17:49:03.5000
date_obs	2006-05-13 02:45:26.0000

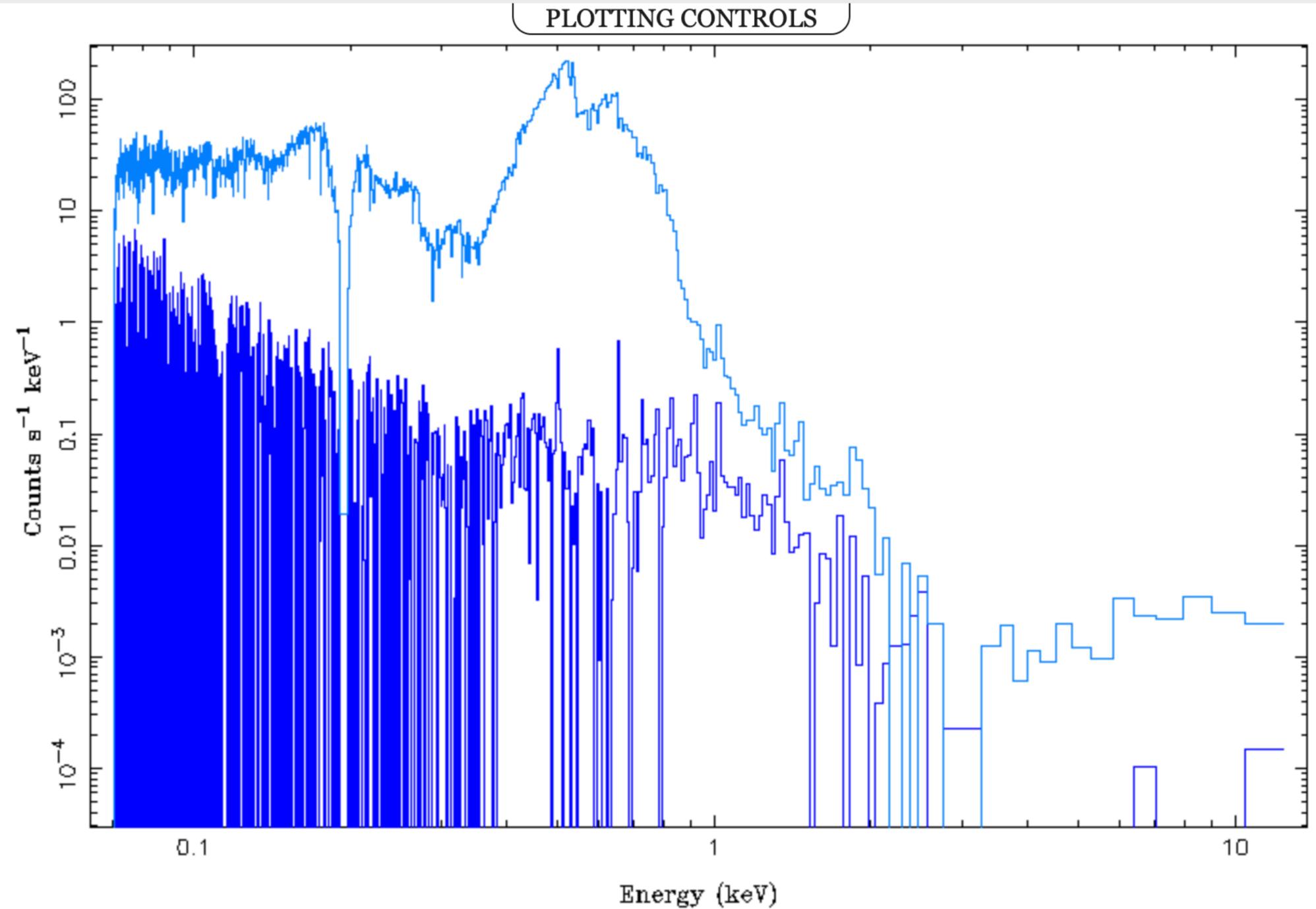


Lets clean up the graphs

# Multi Preview

combined extraction product

object	Multi Preview
obsid	7298, 7297
ids	2527, 2528
srcids	1852
instruments	HRC
gratings	LETG
total_exposure(s)	2.65e+4
ra	267.55487
decl	-6.70797
heg_band(c/s)	4.68e-1
meg_band(c/s)	2.51e+1
leg_band(c/s)	3.89e+1
letg_acis_band(c/s)	3.46e+1
zeroth_order(c/s)	3.53e+1
proc_date	2010-02-23 17:49:03.5000
date_obs	2006-05-13 02:45:26.0000



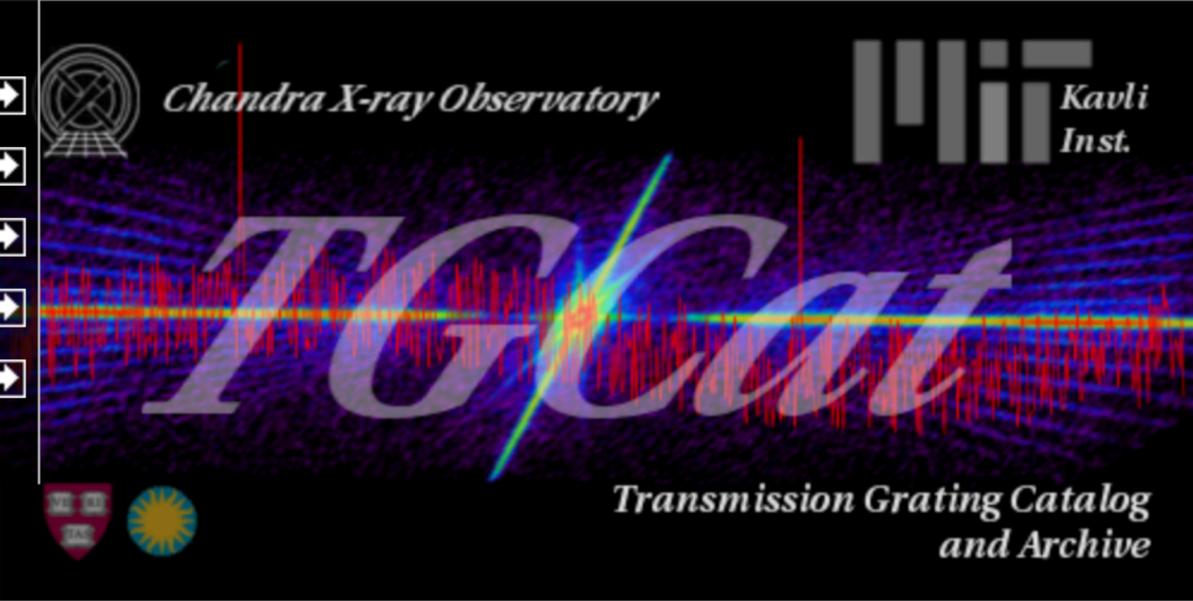
Variability is easily detected

# TGCat Help Page

TGCat	Query	Quick Search	Help Topics	Help
-------	-------	--------------	-------------	------

Start Here. Select functionality from menu items

- Intro
- Known Bugs
- Catalog Creation
- Searching TGCat
- Query Results
- Summary Products
- Plotting
- Demos/Tours/Guides



The banner features the Chandra X-ray Observatory logo on the left, the MIT Kavli Institute logo on the right, and the TGCat logo in the center. Below the TGCat logo, it reads 'Transmission Grating Catalog and Archive'. The background is a dark blue and purple space-themed image with a bright light source and diffraction patterns.

[TGCat Announcements \[all\]](#)

---

[Serendipitous Source Extraction Request Form](#)

---

If you use **TGCat** in your research, please cite: [Huenemoerder et al. 2011 \(AJ, 141, 129\)](#).

# Downloading Observations

Lets go back to our original search

TGCat	Query	View	Actions	Help Topics						Help
<i>---- currently viewing extractions table ----</i>										
+/-	Links	obsid	object	instrument	grating	ra (h:m:s)	decl (d:m:s)	date_obs (y-m-d t)	exposure (s)	
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	100	<a href="#">4U 0614+091</a>	HRC	LETG	06:17:07.414	+09:08:13.632	1999-11-28 22:26:07	26126.1	
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	10759	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.363	+09:08:13.488	2009-01-24 05:07:34	59678.4	
<input type="checkbox"/>	<a href="#">opvs</a>	10760	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-18 23:07:34	44687.8	
<input type="checkbox"/>	<a href="#">opvs</a>	10858	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.358	+09:08:13.524	2009-01-19 17:45:01	34436.8	
<input checked="" type="checkbox"/>	<a href="#">opvs</a>	10857	<a href="#">4U 0614+091</a>	ACIS	HETG	06:17:07.366	+09:08:13.524	2009-01-21 13:49:21	58053.2	

# Downloading Observations

*Please select the products you wish to download:*

## **default:**

- PHA2 (Level 2 counts spectrum file)  PHA1 (Column format spectrum)  
 RMF (Response matrix file)  ARF (Ancillary response file)

## **auxillary:**

- EVT2 (Level 2 event file)  LTC (Binned light curve file)  
 OBSPAR (Observation parameter file)  SUM (Summary image/tables)

*enter an email address for optional notification.  
Click for more details.*

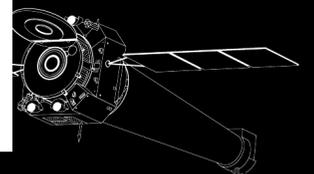
optional email address:  OR tag:

*Downloaded products can be found by navigating to  
TGCat->Package Download Area on the main menu bar.*

Apply Close

TGCat	Query
+/-	Links
<input checked="" type="checkbox"/>	opvs 100
<input checked="" type="checkbox"/>	opvs 1075
<input type="checkbox"/>	opvs 1076
<input type="checkbox"/>	opvs 1085
<input checked="" type="checkbox"/>	opvs 1085

Help
exposure (s)
26126.1
59678.4
44687.8
34436.8
58053.2

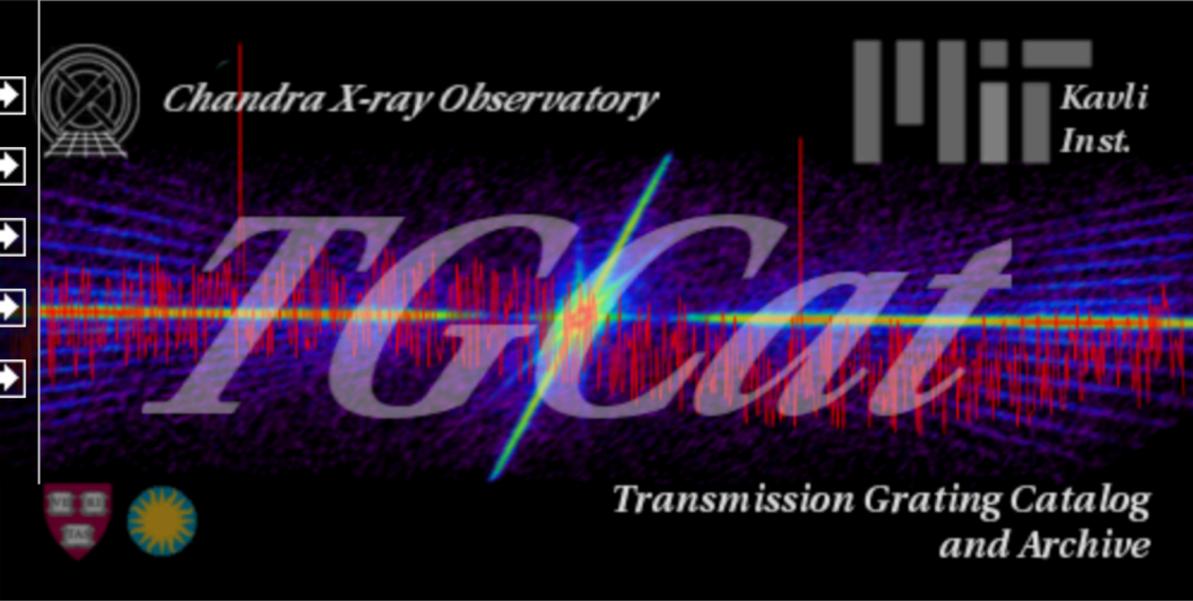


# TGCat Help Page

TGCat	Query	Quick Search	Help Topics	Help
-------	-------	--------------	-------------	------

Start Here. Select functionality from menu items

- Intro
- Known Bugs
- Catalog Creation
- Searching TGCat
- Query Results
- Summary Products
- Plotting
- Demos/Tours/Guides



The banner features the Chandra X-ray Observatory logo on the left, the MIT Kavli Institute logo on the right, and the TGCat logo in the center. Below the TGCat logo, it reads 'Transmission Grating Catalog and Archive'. The background is a dark blue and purple space-themed image with a bright light source.

[TGCat Announcements \[all\]](#)

---

[Serendipitous Source Extraction Request Form](#)

---

If you use **TGCat** in your research, please cite: [Huenemoerder et al. 2011 \(AJ, 141, 129\)](#).

# TGCat Help Page

TGCat

Query

Quick Search

Help Topics

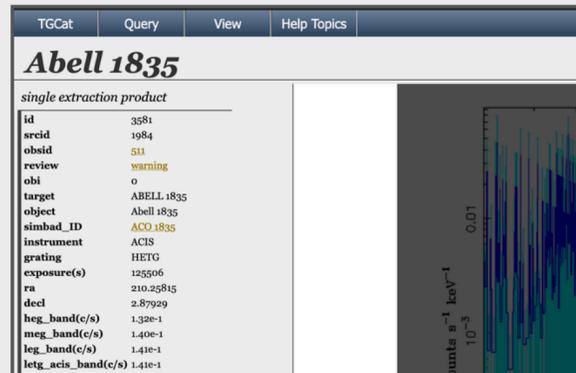
Help

## Known Bugs

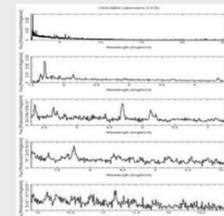
If any bugs are found that are not listed below, please send any comments or updates to the TGCat administrator at [mki-tgcat@mit.edu](mailto:mki-tgcat@mit.edu).

### Unable to click on plotting parameter boxes

TGCat allows users to plot spectra with either default parameters or select the plot parameters to best highlight any desired features of the spectra.

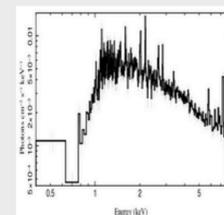


### Flux spectrum



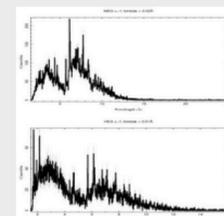
Flux spectrum ([photons/cm<sup>2</sup>/s]). The first panel shows a broad spectral range, while subsequent panels show detail in smaller wavelength ranges. Positive and negative orders have been summed. For HETGS, HEG and MEG have been combined by regridding the higher resolving power HEG data and responses to the MEG grid. Flux correction is done by dividing the counts by the model rate for a flat sky. (There is no flux plot for LETG/HRC-S, since it is not a flat sky instrument.)

### Flux overview



A flux spectrum, adaptively binned to a fixed ratio and a minimum number of bins. This is used for a quick overview of the spectrum (and is the pop-up plot as you move the mouse over the table's obsid or object links). For LETG/HRC-S, order-sorting cannot be done, and there are some artifacts.

### Counts spectrum



Counts spectrum (counts per bin) for summed positive and negative orders (first orders only, if ACIS). For LETGS, the background has been subtracted (ACIS background is usually negligible). For LETG/HRC-S, the first panel shows a broad spectral range, and subsequent panels show expanded regions. For HETG we show the HEG and MEG separately.

- The source table, like the extractions table, provides links for the user

**s** -- Is a link to a *\_SIMBAD* identifier query using the "object" field in the TGCat database  
**b** -- Searches *BiRD* ( XMM RGS Catalog ) on the *SIMBAD* identifier  
**d** -- Starts a *DataScope* ( NVO ) cone search centered on the *SIMBAD* identifier coordinates with a search radius ( *SR* ) equal to 0.05 degrees



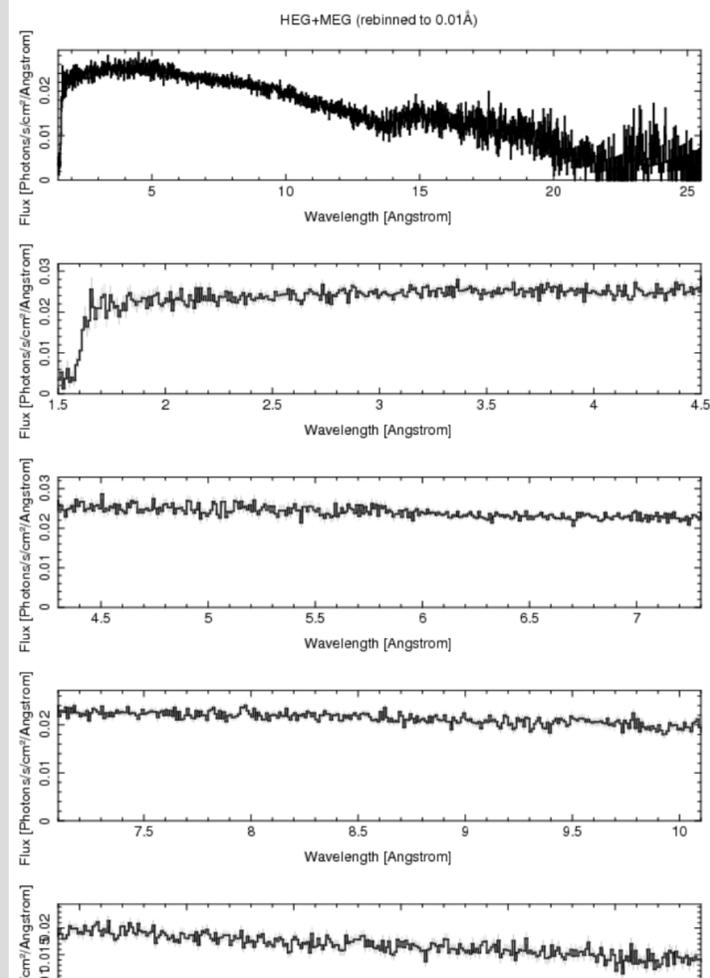
# Single observation



close

description

full size



# Search types

