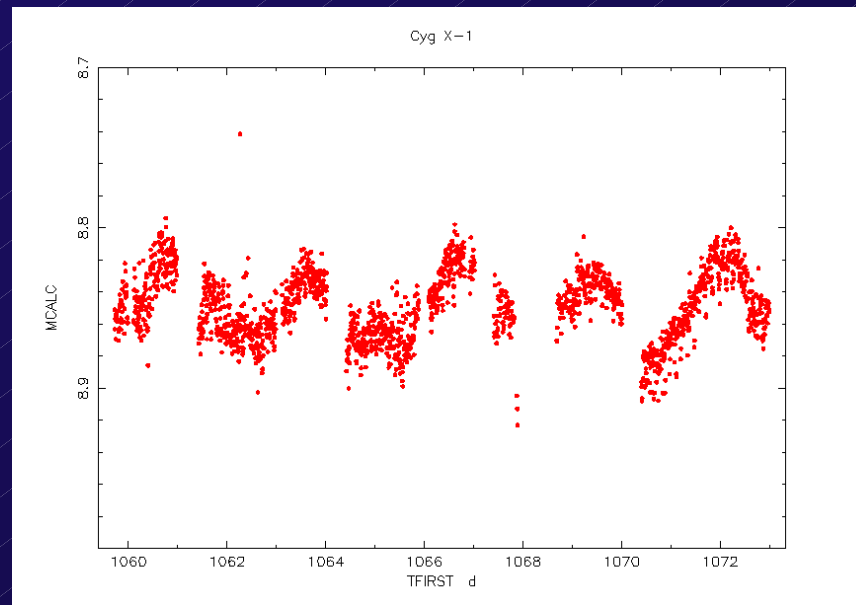


Data analysis with OMC: Magnitude light curve



Daniel Rísquez
Albert Domingo

Talk outline

- Standard analysis.
 - 11x11 pixel boxes.
- Extended sources.
 - Sources with low precision coordinates.
 - They are mosaics of 11x11 pixel boxes.
- Triggers.
 - To monitor GRBs almost in real time.
 - 81x81 pixel boxes (size will change to 91x91).

Required information

- OMC identification number.
 - Example: Cyg X-1 = IOMC 2678000054
 - OMC Input Catalogue (fits, ascii formats)
- Science Windows list.
 - You need a list of SCWs where your source has been observed.
 - ISDC Archive browser.




OMC identification I

UML - Homepage - Netscape

File Edit View Go Bookmarks Tools Window Help

http://sdc.laeff.esa.es/omc/ Search

OMC - Homepage



Not logged in

The OMC Archive

This data server provides access to the INTEGRAL Optical Monitoring Camera (OMC) Archive.

The OMC Data Server includes now all Public data (with date Aug 1, 2004), PV phase and Core Programme OMC data up to revolution 200. The whole set of data has been re processed with the latest calibration available.

Resources

- ▶ [Archive search and data retrieval](#)
- ▶ [System Overview](#)
- ▶ [Help Desk](#)
- ▶ [Project Documentation](#)
- ▶ [Change your password](#)

The system is developed and maintained by LAEFF, based on data processed by ISDC. LAEFF is part of the Space Science Division of INTA.

If you use OMC data in your research, please include the following acknowledgement in any resulting publications.
"Data on data from the OMC Archive at LAEFF processed by ISDC"

Document: Dove (0.372 secs)

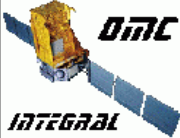

OMC identification II

OMC - Search Results - Netscape

File Edit View Go Bookmarks Tools Window Help

https://sdc.laeff.esa.es/omc/secure/login.jsp

OMC - Search Results

User: Daniel Rísquez Oneca [Log out](#)

1 Object found matching your criteria (Sampling time: 630 seconds)

Objects 1 to 1 (Page 1 of 1) [New Search](#)

Download selected in zip format

Mark all:

Light Curves:

Object ID	OMC ID	RA (2000.0)	DEC (2000.0)	V	S.Star	Init Time	End Time	Points	N.C.	Light Curve
FV Aqr	5228000021	34.14583333	-3.81333333	12.5		2002-12-24 08:31:01.0232	2003-11-08 23:40:14.685575	509		Plot Header Fet

Objects 1 to 1 (Page 1 of 1) [New Search](#)

Version 1.4 - April 2004 [Home](#) - LAEFF

Document: Done (0.499 secs)

OMC identification III

OMC - Search Results - Netscape

File Edit View Go Bookmarks Tools Window Help

https://sdc.laeff.esa.es/omc/secure/login.jsp

OMC - Search Results | revolutions | ISDC Error Codes

OMC
INTEGRAL

User: Daniel Rísquez Oneca Log out

3 Objects found matching your criteria (Sampling time: 1 seconds)

Objects 1 to 3 (Page 1 of 1) New Search

Download selected in zip format

Mark all:
Light Curves:

Object ID	OMC ID	RA (2000.0)	DEC (2000.0)	V	S.Star	Prio.	Start Time	End Time	Points	N.C.		
Cyg X-1	2678000031	299.590315	35.20160417	8.72			2002-11-16 22:59:32.715283	2002-12-30 09:27:21.672587	544		Plot	He
Cyg X-1	2678000054	299.59033203	35.20161057	8.95		1	2002-11-16 20:19:45.960564	2004-05-12 23:41:24.36186	10255		Plot	He
Cyg X-1	2678000044	299.59125	35.19903				2002-11-16 20:19:45.960564	2003-06-30 20:31:49.361499	7901		Plot	He

Objects 1 to 3 (Page 1 of 1) New Search

Document: Done (0.606 secs)

Select the OMC_ID with the lowest number in the priority field.

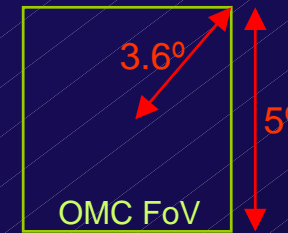
The lowest number has the greatest priority when downloading sub-windows.

OMC identification IV

Special OMC_ID numbers:

- Observer source: 988800000?
- Extension Catalogue sources: 977700????
- Dark current sub-windows: 9999999999

Science Windows list



Create text file with DOL list. It's useful to select SCWs by coordinates.

```
idx2dol index="swg_idx_omc.fits[1]" select="RA_SCX>331.5 && RA_SCX<337.7 && DEC_SCX>-7.4 && DEC_SCX<-0.2" numLog=0 outFormat=2 txtFile="OMC_5228000021.dol"
```

```
idx2dol index="swg_idx_omc.fits[1]" select="TSTART>1089 && TSTOP< 1090" numLog=0 outFormat=2 txtFile="OMC_5228000021.dol"
```

```
Terminal
kafka:talkGeneva/beautyStars 106 >less OMC_5228000021.dol
/projects/omc_arc/rev_1/scw/0024/002400030010.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030020.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030030.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030040.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030050.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030060.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030070.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030080.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030090.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030100.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030110.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030120.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030130.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030140.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030150.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030160.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030170.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400030180.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400040010.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400040020.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400040030.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400040040.001/swg_prp.fits [GROUPING,1,BINTABLE]
/projects/omc_arc/rev_1/scw/0024/002400040050.001/swg_prp.fits [GROUPING,1,BINTABLE]
```


Create Observation Group

- `ln -s /projects/omc_arc/rev_1/aux aux`
- `ln -s /projects/omc_arc/rev_1/ic ic`
- `ln -s /projects/omc_arc/rev_1/idx idx`
- `ln -s /projects/omc_arc/rev_1/scw scw`
- `og_create OMC_522800021.dol instrument=OMC baseDir=. Ogid=FY-Aqr versioning=1`

Links to archive

Observation group directory name

```
Terminal
kafka:obs/FY-Aqr.000 138 >ll scw/
total 364k
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030010/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030020/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030030/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030040/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030050/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030060/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030070/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030080/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030090/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030100/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030110/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030120/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030130/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030140/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030150/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030160/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030170/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400030180/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400040010/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:44 002400040020/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:45 002400040030/
drwxr-xr-x  3 risquez  4.0k Sep 28 19:45 002400040040/
```

```
27 Sep 28 19:43 aux -> /projects/omc_arc/rev_1/aux/
26 Sep 28 19:43 ic -> /projects/omc_arc/rev_1/ic/
27 Sep 28 19:43 idx -> /projects/omc_arc/rev_1/idx/
0k Sep 28 19:24 OMC_5228000021.fits
0k Sep 28 19:44 obs/
5k Sep 28 19:38 OMC_5228000021.dol
59 Sep 28 19:44 README
27 Sep 28 19:43 scw -> /projects/omc_arc/rev_1/scw/
3 >
```

Execute the analysis

If this variable has any value `omc_science_analysis` works in script mode, else it will open these selection windows.

omc_science_analysis

General

ogDOL: browse

startLevel:

endLevel:

Save

Save As

Run

Quit

Help

hidden

Good Time Intervals

GTI_gtiUser: browse

GTI_TimeFormat:

GTI_Accuracy:

Source Fluxes

IMA_timestep:

IMA_maxCentOff:

IMA_numSigma:

IMA_minshottime:

IMA_maxshottime:

- `cd obs/FY-Aqr.000`
- `setenv COMMONSCRIPT 1`
- `setenv COMMONLOGFILE omc.log`
- `omc_science_analysis`
`ogDOL="./og_omc.fits[GROUPING]"`
`startLevel=COR endLevel=IMA`
`GTI_Accuracy=any IMA_timestep=1`

hidden

Correction | Good Time Intervals | Source fluxes | IC | General

Ok

Help

IMA_badPixels: browse

IMA_photCal: browse

IMA_magboxsize:

IMA_minSNR:

IMA_skyStdDev:

IMA_usePrp: checked: yes

IMA_minBoxFrac:

IMA_minTimeFrac:

Read-out noise values specified by OMC Team

IMA_noiseLowLeft:

IMA_noiseLowRight:

IMA_noiseHighLeft:

IMA_noiseHighRight:

IMA_timestep: 1 sec (don't combine shots), 630 sec (standard), 9000 sec (all data in SCW).

IMA_magboxsize: 1 pix (for sources with low flux, very high contamination, only for advanced users), 3 pix (high contamination), 5 pix (standard).

IMA_minshottime - IMA_maxshottime: Use shots between this interval. Combine shots with very different EXPOSURE times can give very noisy results for faint sources.

Execute the analysis

Create file with final data

→ `o_src_collect group="og_omc.fits[1]" results=omc/phot.timestep1.fits`

Look `omc.log` file (or your `COMMONLOGFILE` variable). Scripts must finish with `status=0`.

```
emacs@kafka.laeff.esa.es
Buffers  Files  Tools  Edit  Search  Mule  Help
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Parameter magboxsize = 5
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Parameter minSNR = 1
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Parameter clobber = yes
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Parameter mode = h
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Ending parameters
Log_1 2004-09-29T16:51:36 o_src_compute_mag 4.3.2: Running in scripting mode, no parameter prompting
Log_1 2004-09-29T16:51:37 o_src_compute_mag 4.3.2: Stored MAG_V and ERRMAG_V into OMC-SRCL-RES --STAMP-- scw/002500010130/omc/res/omc_s\
rcl_res.fits[OMC,-SRCL-RES,1,BINTABLE]
Log_1 2004-09-29T16:51:38 o_src_compute_mag 4.3.2: Task o_src_compute_mag terminating with status 0
Log_1 2004-09-29T16:51:38 o_src_analysis 3.8: Task o_src_analysis terminating with status 0
Log_1 2004-09-29T16:51:38 omc_scw_analysis 3.8: Finished level 1th source fluxes and magnitudes
Log_1 2004-09-29T16:51:38 omc_scw_analysis 3.8: Task omc_scw_analysis terminating with status 0
Log_1 2004-09-29T16:51:45 omc_science_analysis 3.8: change level --STAMP-- og_omc.fits[GROUPING,1,BINTABLE]
Log_1 2004-09-29T16:51:45 omc_science_analysis 3.8: Task omc_science_analysis terminating with status 0
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Task o_src_collect running in SINGLE mode
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Beginning parameters
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Parameter group = og_omc.fits[1]
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Parameter results = omc/phot.timestep630.fits
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Parameter select =
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Parameter attach = no
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Parameter chatter = 1
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Ending parameters
Log_1 2004-09-30T06:59:07 o_src_collect 2.2: Running in normal mode, default parameter prompting
Log_1 2004-09-30T07:19:48 o_src_collect 2.2: Combined OMC source results --STAMP-- omc/phot.timestep630.fits[OMC,-STAN-RES,1,BINTABLE]
Log_0 2004-09-30T07:19:48 o_src_collect 2.2: Wrote 77670 entries to output table
Log_1 2004-09-30T07:19:48 o_src_collect 2.2: Task o_src_collect terminating with status 0

--:** omc.log (Fundamental)--L??--C109--Bot-----
```

- `cd omc`
- `fcopy "phot.timestep1.fits[OMC_ID=='5228000021']" phot.timestep1.5228000021.fits`

Results I

- fv phot.timestep1.5228000021.fits

fv: Binary Table of phot.timestep1.5228000021.fits[1] in /pcdisk/kafka2/risquez/talkGeneva/beautyStars/obs/FY-Aqr.000/omc/

File Edit Tools Help

REVOL 11 SWID 12A TFIRST 1D d BARYTIME 1D d TELAPSE 1D s EXPOSURE 1D s SHOTTYPE 11

	1	24	002400030010	1.088355615813E+03	1.088353010988E+03	1.000000534058E+02	1.000000534058E+02	2
1	24	002400030010	1.088358865236E+03	1.088356260109E+03	3.000001525879E+01	3.000001525879E+01	2	
2	24	002400030010	1.088361191626E+03	1.08835886283E+03	1.000000572204E+01	1.000000572205E+01	2	
3	24	002400030010	1.088361941048E+03	1.088359335635E+03	1.000000534058E+02	1.000000534058E+02	2	
4	24	002400030010	1.088365193364E+03	1.088362587650E+03	3.000001716614E+01	3.000001716614E+01	2	
5	24	002400030010	1.088367519754E+03	1.088364913825E+03	1.000000476837E+01	1.000000476837E+01	2	
6	24	002400030010	1.088368269176E+03	1.088365663177E+03	1.000000534058E+02	1.000000534058E+02	2	
7	24	002400030010	1.088371525833E+03	1.088368919533E+03	3.000001525879E+01	3.000001525879E+01	2	
8	24	002400030010	1.088373856563E+03	1.088371250048E+03	1.000000572204E+01	1.000000572205E+01	2	
9	24	002400030010	1.0883746133E+03	1.088371250048E+03	1.000000572204E+01	1.000000572205E+01	2	
10	24	002400030010	1.088377864E+03	1.088377864E+03	0.00534058E+02	0.00534058E+02	2	
11	24	002400030010	1.088377864E+03	1.088377864E+03	0.01525879E+01	0.01525879E+01	2	
12	24	002400030010	1.088380189E+03	1.088380189E+03	0.00476837E+01	0.00476837E+01	2	
13	24	002400030010	1.088380937007E+03	1.088378329838E+03	1.000000534058E+02	1.000000534058E+02	2	

Go to: Edit cell:

TFIRST with barycentric correction

Effective CCD exposure time

1:Photometric
2:Science

Results II

- fv phot.timestep1.5228000021.fits

fv: Binary Table of phot.timestep1.5228000021.fits[1] in /pcdisk/kafka2/risquez/talkGeneva/beautyStars/obs/FY-Aqr.000/omc/

File Edit Tools Help

REVOL SWID TFIRST BARYTIME TELAPSE EXPOSURE SHOTTYPE

11

fv: Binary Table of phot.timestep1.5228000021.fits[1] in /pcdisk/kafka2/risquez/talkGeneva/beautyStars/obs/FY-Aqr.000/omc/

File Edit Tools Help

OMC_ID TYPE_TAR RA_OBJ DEC_OBJ FLUX_1 ERFLUX_1 FLUX_3

12A 11 1D 1D 1D 1D 1D

deg deg electron/s electron/s electron/s

	OMC_ID	TYPE_TAR	RA_OBJ	DEC_OBJ	FLUX_1	ERFLUX_1	FLUX_3
1	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.623901478215E+02	1.408558219032E+00	1.439340729793E+02
2	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.531184806799E+02	2.889184451816E+00	1.340235276554E+02
3	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.499834907251E+02	6.239954096164E+00	1.290398441427E+02
4	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.586138979049E+02	1.398527551013E+00	1.361182401126E+02
5	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.647851507439E+02	3.072715749758E+00	1.418532097935E+02
6	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.415041272096E+02	6.327439963802E+00	1.395649752298E+02
7	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.483848388374E+02	1.358593780495E+00	1.459994598608E+02
8	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.487161211849E+02	2.822565734910E+00	1.397538432079E+02
9	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.420855520369E+02	6.144897630192E+00	1.369871457435E+02
10	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.494181549529E+02	1.363334324798E+00	1.415428979066E+02
11	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.373662306388E+02	2.725546035693E+00	1.360880547837E+02
12	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.341937766287E+02	6.092891859819E+00	1.293308342480E+02
13	5228000021	11	3.341458333300E+02	-3.813333330000E+00	1.450289213754E+02	1.345082301337E+00	1.407741538395E+02

Go to: Edit cell:

Results III

- fv phot.timestep1.5228000021.fits

The screenshot shows a FITS viewer window with the following table of data:

	ERFLUX_3 1D electron/s	FLUX_5 1D electron/s	ERFLUX_5 1D electron/s	SKYBACK 1D electron/pixel/s	SKYERROR 1D electron/pixel/s	SIZE_MAG 1B
1	2.078563235663E+00	1.427993858439E+02	2.875859933870E+00	1.102393033085E+01	2.177076418098E-01	5
2	5.514976785314E+00	1.262674464825E+02	8.113832228842E+00	1.186091325841E+01	7.733555141394E-01	5
3	1.429732387845E+01	1.142255959238E+02	2.159299884364E+01	1.273173767181E+01	1.554199719289E+00	5
4	2.078247123430E+00	1.347716548051E+02	2.893578792599E+00	1.122688859648E+01	2.344622981842E-01	5
5	6.026475962821E+00	1.830387094609E+02	9.007079284350E+00	1.147730595298E+01	1.147245741956E+00	5
6	1.486758941604E+01	1.342688451829E+02	2.247804702446E+01	1.244724713934E+01	2.095563340367E+00	5
7	2.086966586883E+00	1.469806110340E+02	2.889024948073E+00			5
8	5.360584440979E+00	1.359704094330E+02	7.855964935075E+00			5
9	1.421648568502E+01	1.536956723620E+02	2.151378011579E+01			5
10	2.081207836840E+00	1.362773532789E+02	2.878935162141E+00			5
11	5.228202322159E+00	1.385921783579E+02	7.665806617809E+00	1.211747639085E+01	4.425107699832E-01	5
12	1.423252461334E+01	1.096029895992E+02	2.147872279282E+01	1.229555447790E+01	1.491450435594E+00	5
13	2.068672147011E+00	1.390060193386E+02	2.865355240795E+00	1.112658731948E+01	2.125849493154E-01	5

Flux used for calculate MAG_V. It can be 1,3 or 5.

Results IV

- fv phot.timestep1.5228000021.fits

The screenshot shows a FITS viewer window with a table of data. The table has 13 rows and 10 columns. The columns are labeled as follows: MAG_V (1E mag), ERRMAG_V (1E mag), CATMAG_V (1E mag), CATERR_V (1E mag), PROBLEMS (11), NOISE_LL (1E electron), NOISE_LR (1E electron), and NOISE_HL (1E electron). The first two columns contain numerical values in scientific notation. The PROBLEMS column contains the value '11' for the 11th row. Two blue callout boxes with red arrows point to the 'ERRMAG_V' and 'PROBLEMS' columns, with text explaining that small values are less important.

	MAG_V	ERRMAG_V	CATMAG_V	CATERR_V	PROBLEMS	NOISE_LL	NOISE_LR	NOISE_HL
	1E mag	1E mag	1E mag	1E mag	11	1E electron	1E electron	1E electron
1	2.078563235							
2	5.514976785							
3	1.429732387							
4	2.078247123							
5	6.026475962							
6	1.486758941							
7	2.086966586							
8	5.360584440							
9	1.421648568							
10	2.081207836							
11	5.228202322				11			
12	1.423252461							
13	2.068672147							

Result and its error

Comments to results. Small values are less important.

Results V

- fv phot.timestep1.522800021.fits

The screenshot shows a FITS viewer window displaying a table of data. The table has the following columns: NOISE_LR (1E electron), NOISE_HL (1E electron), NOISE_HR (1E electron), CENTRING_X (11 pixel), CENTRING_Y (11 pixel), X_TAR (11), Y_TAR (11), and RANK (11). The data rows are numbered 1 to 13. Red circles highlight the columns CENTRING_X, CENTRING_Y, X_TAR, Y_TAR, and RANK. Red arrows point from these columns to three blue boxes with white text. The first box explains CENTRING_X and CENTRING_Y, the second explains X_TAR and Y_TAR, and the third explains RANK. The viewer interface includes menu bars (File, Edit, Tools) and various checkboxes for column selection.

	NOISE_LR 1E electron	NOISE_HL 1E electron	NOISE_HR 1E electron	CENTRING_X 11 pixel	CENTRING_Y 11 pixel	X_TAR 11	Y_TAR 11	RANK 11
1	4.900000E+01	3.300000E+01	3.500000E+01	1	-1	187	615	56
2	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
3	4.900000E+01	3.300000E+01	3.500000E+01	1	-1	187	615	56
4	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
5	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
6	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
7	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
8	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
9	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
10	4.900000E+01	3.300000E+01	3.500000E+01	1	0	187	615	56
11	4.900000E+01	3.300000E+01	3.500000E+01	0	0	187	615	56
12	4.900000E+01	3.300000E+01	3.500000E+01	0	0	187	615	56
13	4.900000E+01	3.300000E+01	3.500000E+01	0	0	187	615	56

Object coordinates related to the center of each small box

Box position into CCD (1024x1024 pixels)

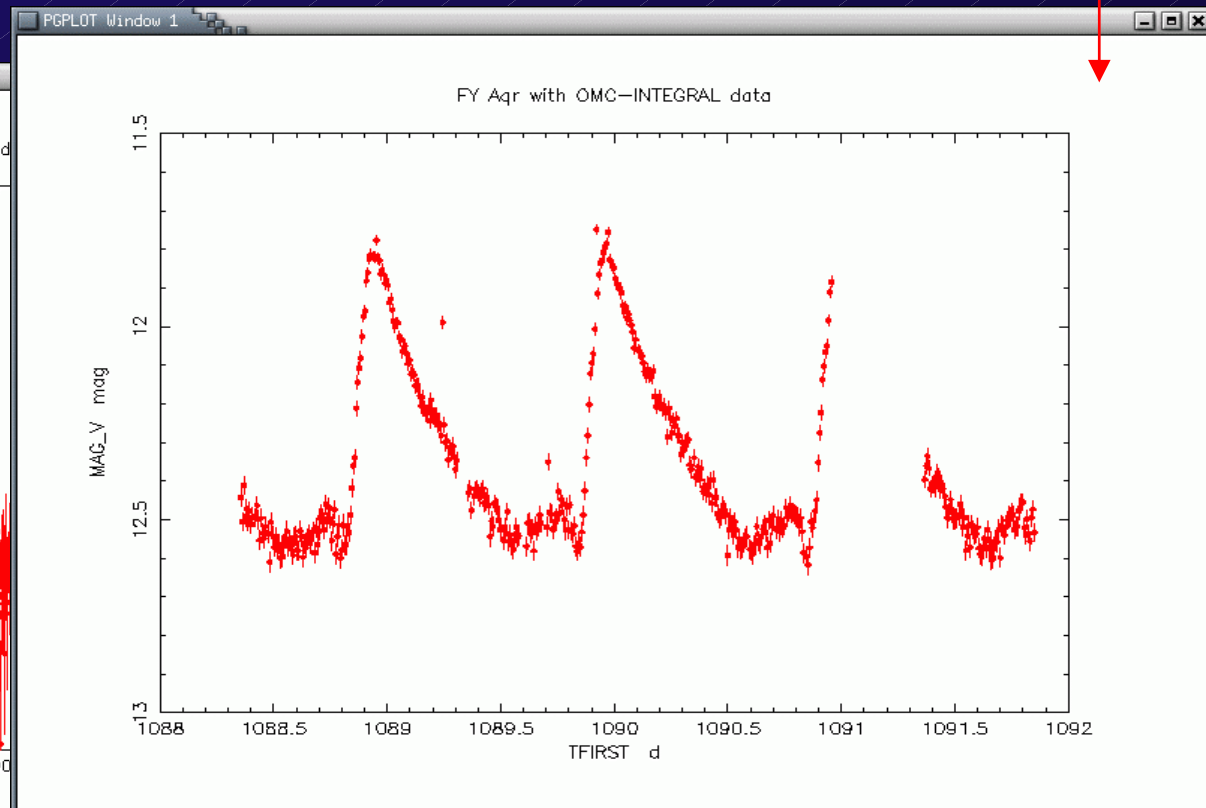
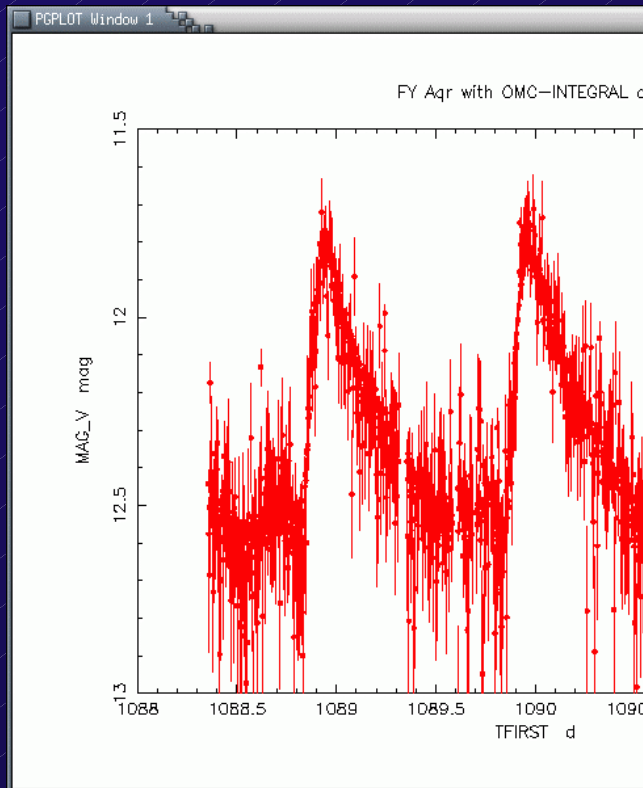
Running number of box as sent in the TC.

Results VI

- `cd omc`
- `curveplot phot.timestep1.5228000021.fits "1088 1092" "13 11.5" "FY Aqr with OMC-INTEGRAL data"`

`curveplot` is a script that draw `MAG_V` versus `TFIRST`. It is not into OSA 4.X. You can use `fv` instead.

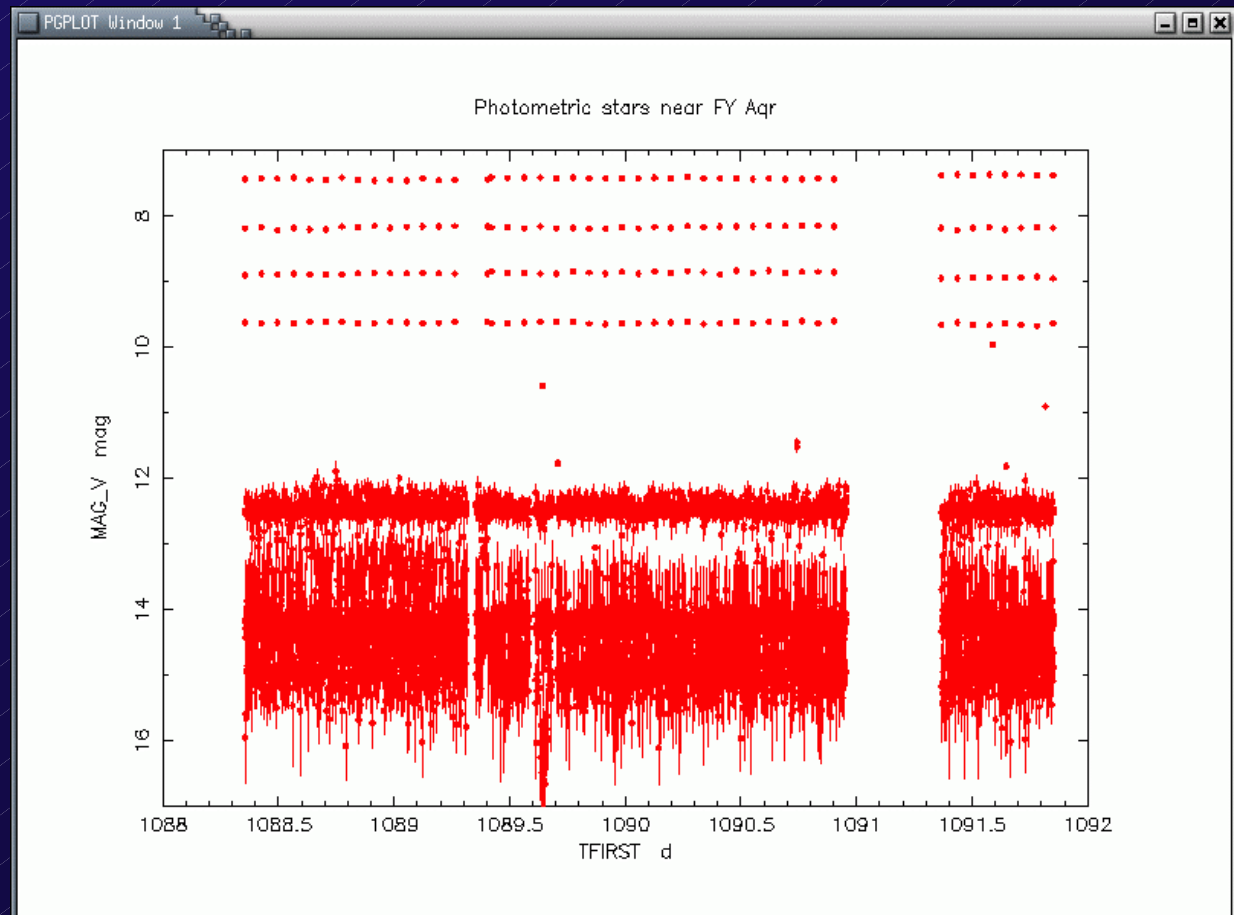
`curveplot "phot.timestep1.5228000021.fits[EXPOSURE>50]" "1088 1092" "13 11.5" "FY Aqr with OMC-INTEGRAL data"`



Check results I

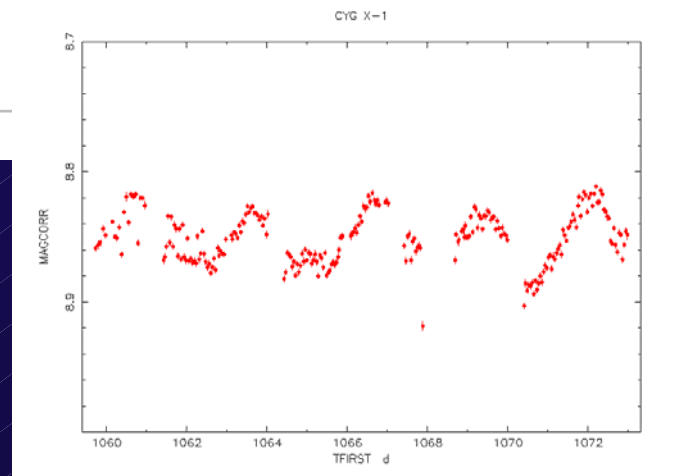
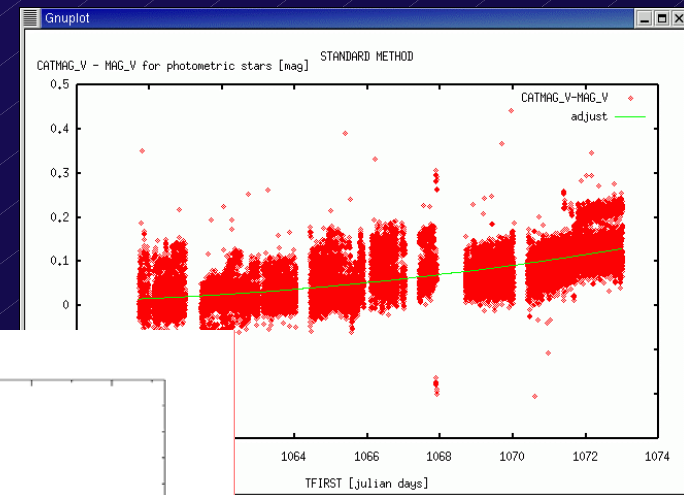
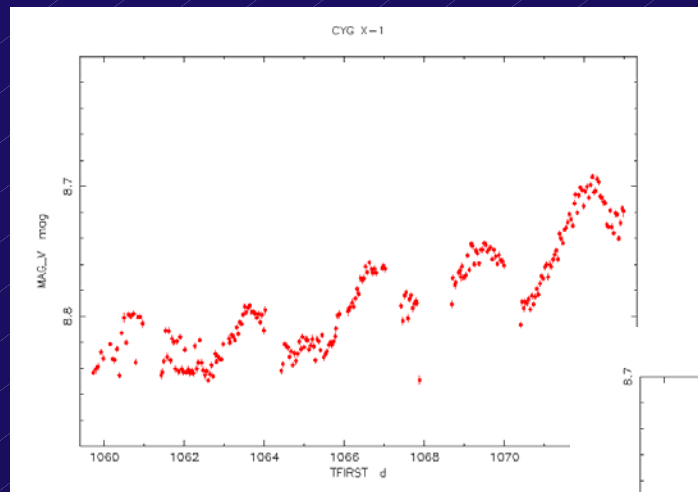
- Photometric shots: 10 stars, usually 1 shot per SCW, with 10 sec exposure.
- Faint photometrics: 5 stars, in science shots, but some of them are occasionally contaminated by other stars.

OK, photometric stars have constant flux.



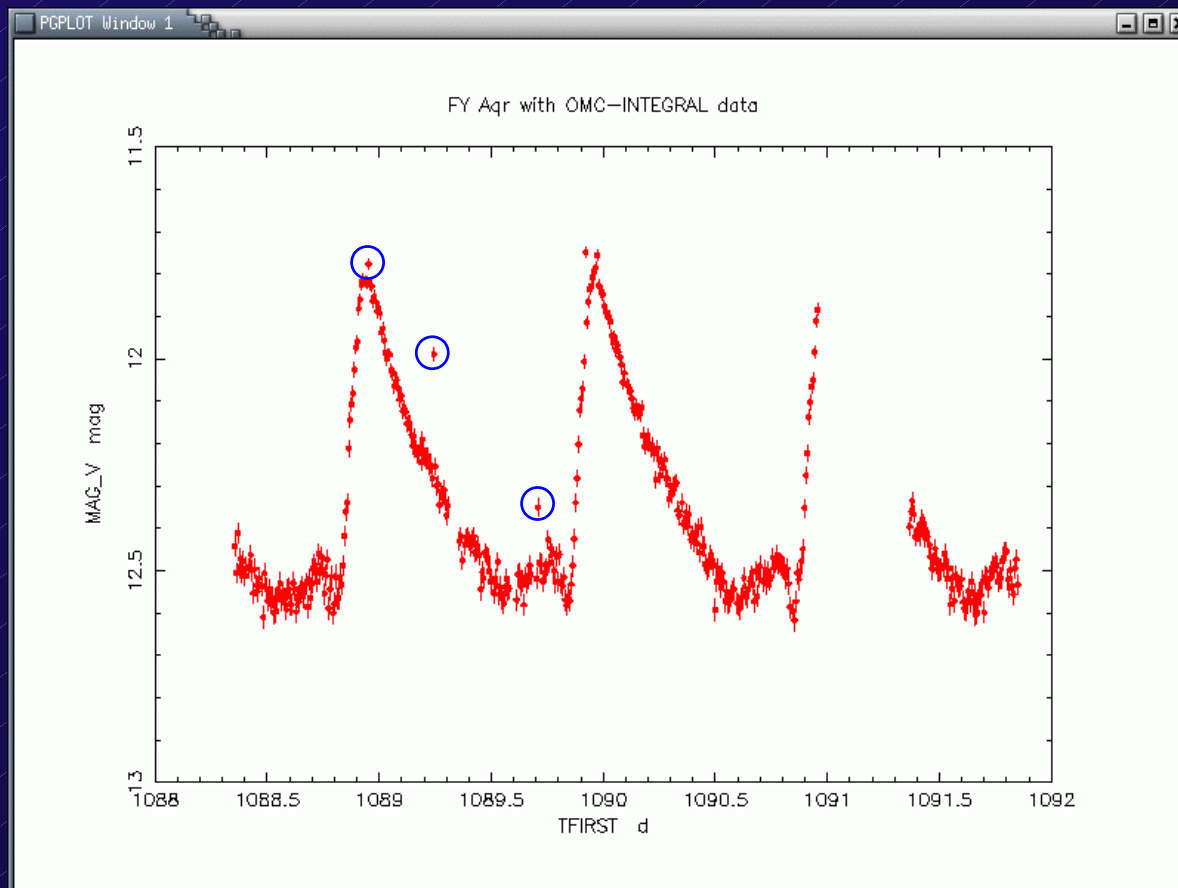
Check results II

- Fast change in sensitivity during first revolutions. This is not corrected with flatfield.

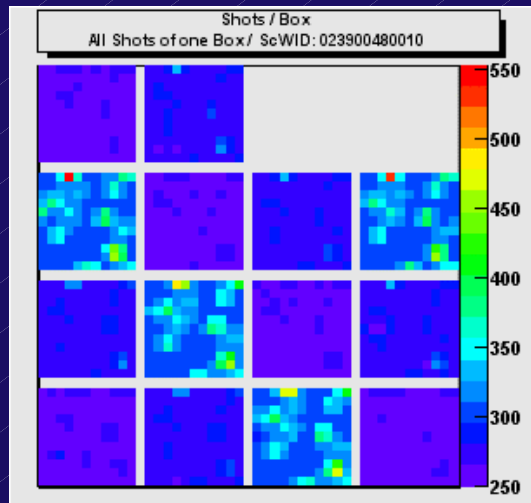


Check results III

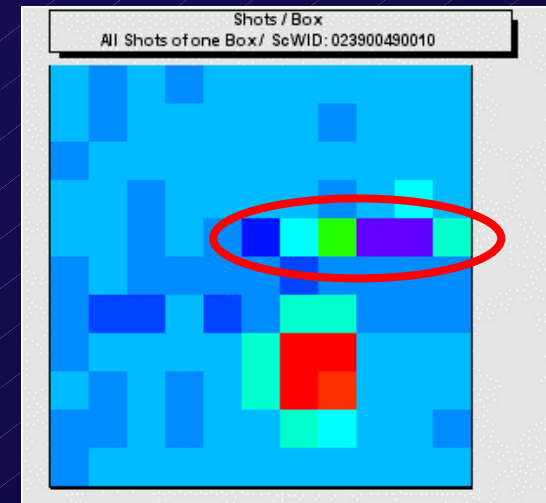
- Some MAG_V values are strange, around a few per 1000. We need to look at the sub-windows for cosmic rays and other problems (e.g. read-out noise).



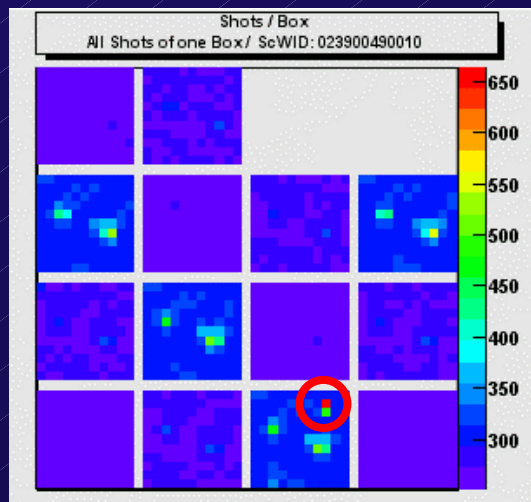
Check results IV



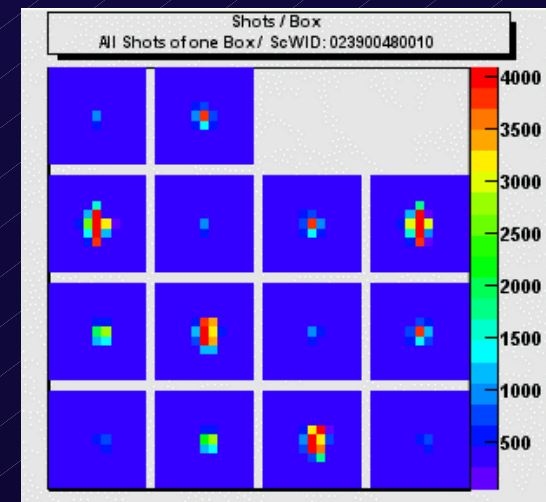
Crowded field.
You should use
an smaller
aperture (usually
FLUX_3)



Readout
noise. They
are
horizontal
groups of
noisy pixels



Cosmic rays.
They don't have
a star profile
(PSF around 1.4
pixels)



Saturated
stars. Use a
smaller
EXPOSURE.

Problems column

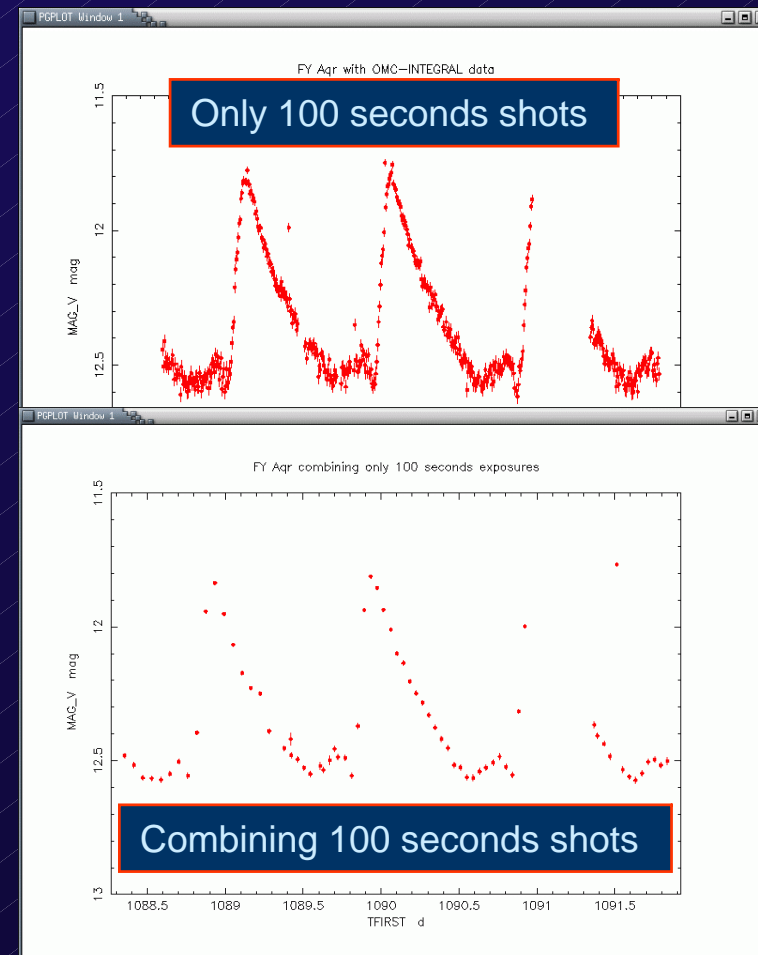
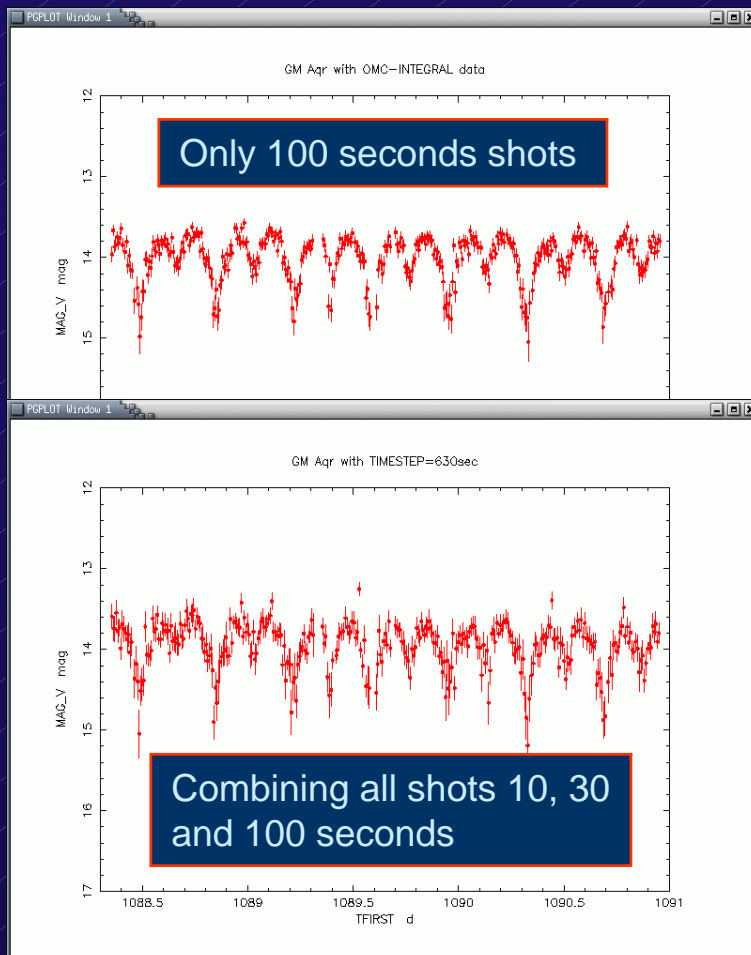
Search updated information with:

`o_src_get_fluxes --help`

```
Terminal
Log_1 :
Log_1 : PROBLEM FLAGS
Log_1 :
Log_1 :      Issues deemed to affect the quality of the standard pipeline analysis of
Log_1 :      individual sources are flagged in the "PROBLEMS" column of OMC.-SRCL-RES.
Log_1 :      The problems are listed in the table below.
Log_1 :
Log_1 :      They are stored in an Unsigned Integer Register, any problem encountered is
Log_1 :      logically ANDed to the existing register value.
Log_1 :
Log_1 :      Deconstruction of the total into its only possible component values reveal
Log_1 :      the individual PROBLEMS.
Log_1 :
Log_1 :      Name                Value      Meaning
Log_1 :      -----
Log_1 :      OMC_PROBLEM_NONE      0          No problems
Log_1 :
Log_1 :      OMC_PROBLEM_EXTRAPOLATED_MAG  2 (2^1)    The mag was extrapolated
Log_1 :      OMC_PROBLEM_BAD_CENTROID      4 (2^2)    No centroid is available or is inaccurate
Log_1 :      OMC_PROBLEM_BAD_PSF           8 (2^3)    Bad PSF. A default value was used
Log_1 :      OMC_PROBLEM_ANOMALOUS_PSF     16 (2^4)   The PSF shape is anomalous
Log_1 :      OMC_PROBLEM_LOW_FLUX_1        32 (2^5)   Flux of central pixel too low
Log_1 :
Log_1 :      OMC_PROBLEM_BADPIXEL_SKY     128 (2^7)  Bad pixel found in sky bgnd
Log_1 :      OMC_PROBLEM_BADPIXEL_RIM_5    256 (2^8)  Bad pixel found in 5x5 rim
Log_1 :      OMC_PROBLEM_BADPIXEL_RIM_3    512 (2^9)  Bad pixel found in 3x3 rim
Log_1 :      OMC_PROBLEM_BADPIXEL_RIM_1   1024 (2^10) Central pixel bad
Log_1 :
Log_1 :      OMC_PROBLEM_SKY_ERROR        4096 (2^12) Sky error larger than accepted limit
Log_1 :      OMC_PROBLEM_UNKNOWN_MAG       8192 (2^13) Magnitude could not be calculated
Log_1 :      OMC_PROBLEM_EXTND_SRC        16384 (2^14) Source is extended - flux not valid
Log_1 :
```

Changing TimeStep

- `og_clean ogDOL="/og_omc.fits[1]" endLevel="GTI"`
- `omc_science_analysis ogDOL="/og_omc.fits[GROUPING]" startLevel=COR endLevel=IMA
GTI_Accuracy=any IMA_timestep=630`
- `o_src_collect group="og_omc.fits[1]" results=omc/phot.timestep630.fits`

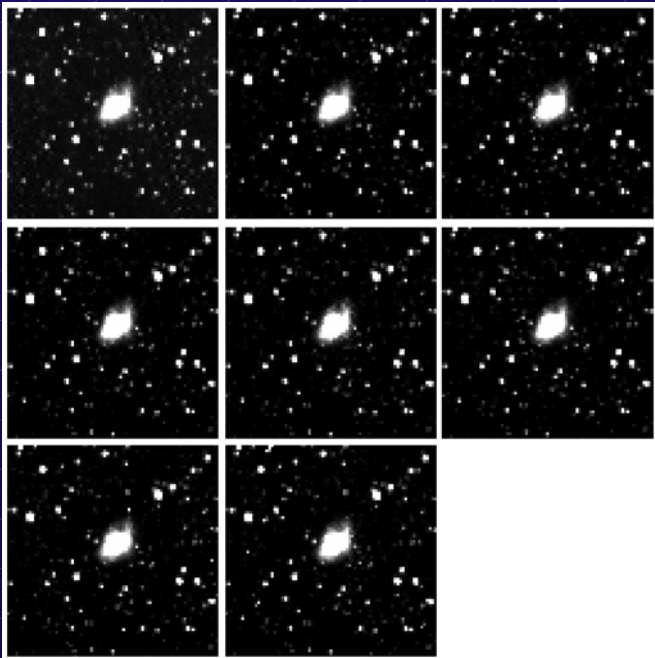


Triggers I

- Crab Nebula, Sep/29, SCW 023900840010
- ✓ Trigger images will be automatically created in OSA 4.2

```
o_ima_build  
inswg="/projects/omc_nrt/ops_1/scw/0239/023900840010.000/swg_prp.fits[1]  
outfitsname="023900840010.trigger.fits" trigger="yes" datalevel="PRP" &
```

```
fv 023900840010.trigger.fits &
```



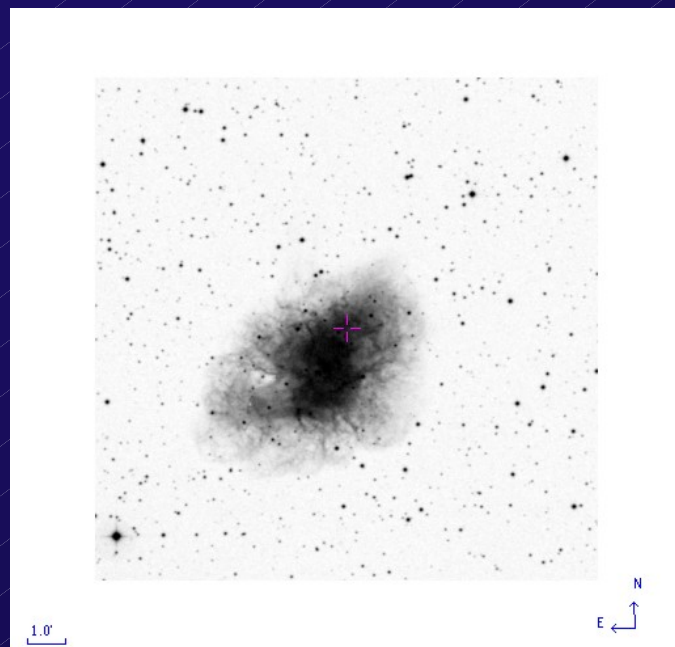
fv: Summary of 023900840010.trigger.fits in /podisk/kafka/risquez/OMC/2004/triggers/sep30/

Index	Extension	Type	Dimension	View
<input type="checkbox"/> 0	Primary	Image	0	Header Image Table
<input type="checkbox"/> 1	GROUPING	Binary	25 cols X 9 rows	Header Hist Plot All Select
<input type="checkbox"/> 2	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 3	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 4	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 5	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 6	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 7	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 8	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table
<input type="checkbox"/> 9	OMC.-SKY.-IMA	Image	81 X 81	Header Image Table

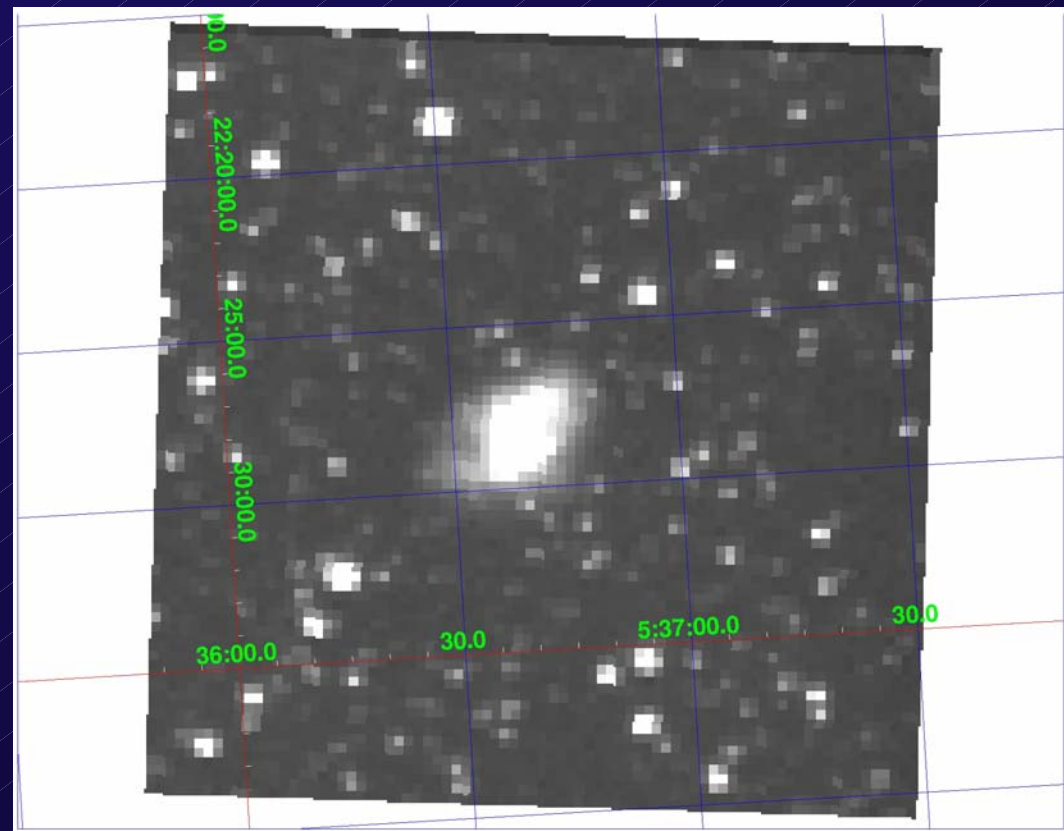
```
ds9 023900840010.trigger.2.fits 023900840010.trigger.3.fits 023900840010.trigger  
.4.fits 023900840010.trigger.5.fits 023900840010.trigger.6.fits 023900840010.trigger.7.fits  
023900840010.trigger.8.fits 023900840010.trigger.9.fits &
```

Triggers II

- You can process data with IRAF. Use BIAS calculated in previous shots, and flatfield from IC.
- Problem: OMC pixels are very big.



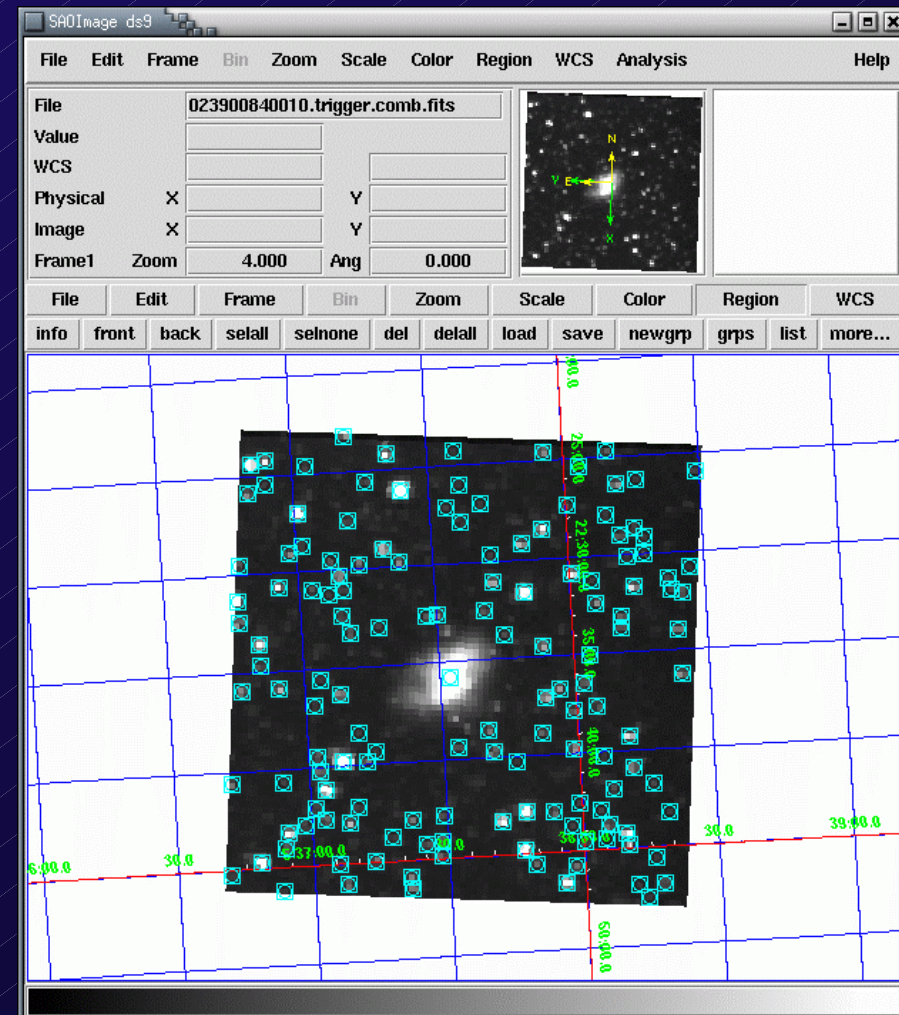
From Aladin. Filter B.



Triggers III

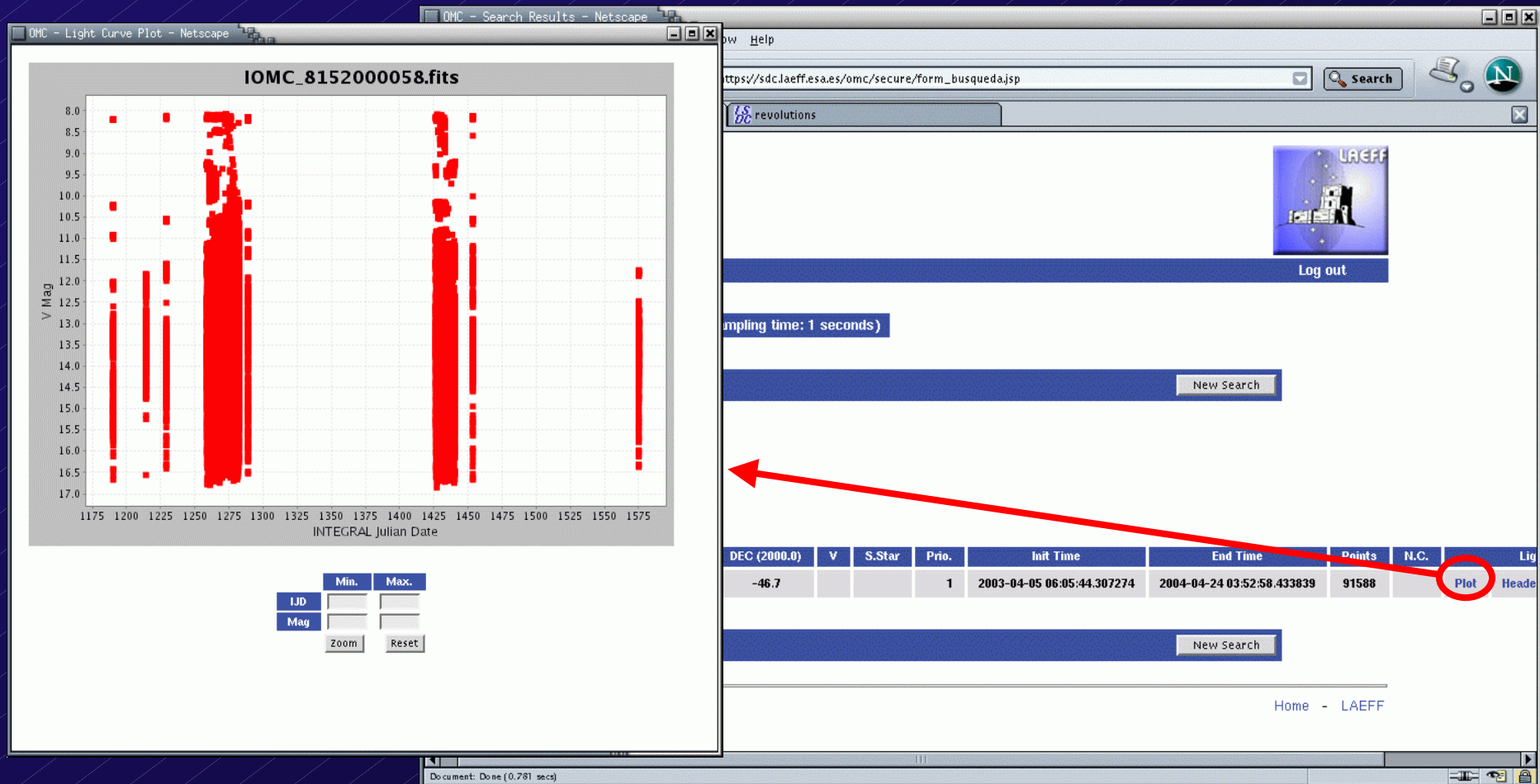
- Standard analysis doesn't work with triggers, but you can obtain photometric data with *IRAF* or *sextractor*.

```
Terminal
kafka:triggers/sep30 77 >sex 023900840010.trigger.comb.fits > sources.reg
Measuring from: "Unnamed" / 81 x 81 / 32 bits FLOATING POINT data
(M+D) Background: 13.5788 RMS: 1.34278 / Threshold: 6.7139
Objects: detected 170 / sextracted 143 0 sextracted
> All done
kafka:triggers/sep30 78 >less sources.reg
# 1 X_IMAGE Object position along x [pixel]
# 2 Y_IMAGE Object position along y [pixel]
# 3 MAG_APER Fixed aperture magnitude vector [mag]
# 4 MAGERR_APER RMS error vector for fixed aperture mag. [mag]
# 5 ELLIPTICITY 1 - B_IMAGE/A_IMAGE
42.676 43.363 10.4824 0.0082 0.250
77.979 21.605 11.3835 0.0147 0.118
24.000 5.647 14.0542 0.1281 0.505
77.447 4.509 13.3350 0.0681 0.042
65.000 4.000 14.9824 0.2946 0.000
32.811 3.499 13.0448 0.0534 0.218
40.738 2.633 12.9650 0.0500 0.102
26.452 3.000 13.5492 0.0823 0.498
22.000 2.000 14.9755 0.2928 0.000
5.000 1.518 14.0594 0.1232 0.500
```



Mosaics I

- Same *OMC_ID* and different *RANK* number in output table of results.
- Be careful. Standard analysis gives strange results because it calculates a magnitude per sub-window.



Mosaics II

- You must build the full FoV CCD images. Be careful, because images are big and almost empty.

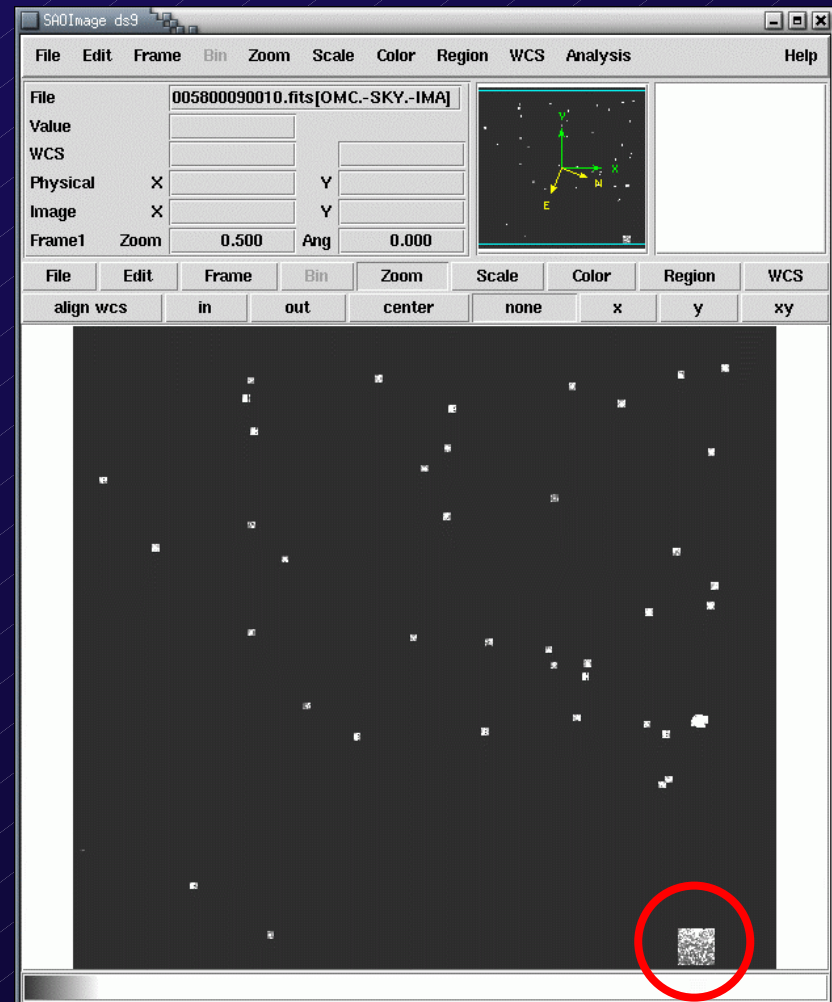
`og_create GRO_J0852-46.partial.dol instrument=OMC baseDir=. ogid=GRO_J0852-46 versioning=1 &`

`omc_science_analysis ogDOL="/og_omc.fits[GROUPING]" startLevel=COR endLevel=COR chatter=1 &`

`o_ima_build inswg="obs/GRO_J0852-46/scw/005800090010/swg_omc.fits[1]" outfitsname="005800090010.fits" datalevel="COR" &`

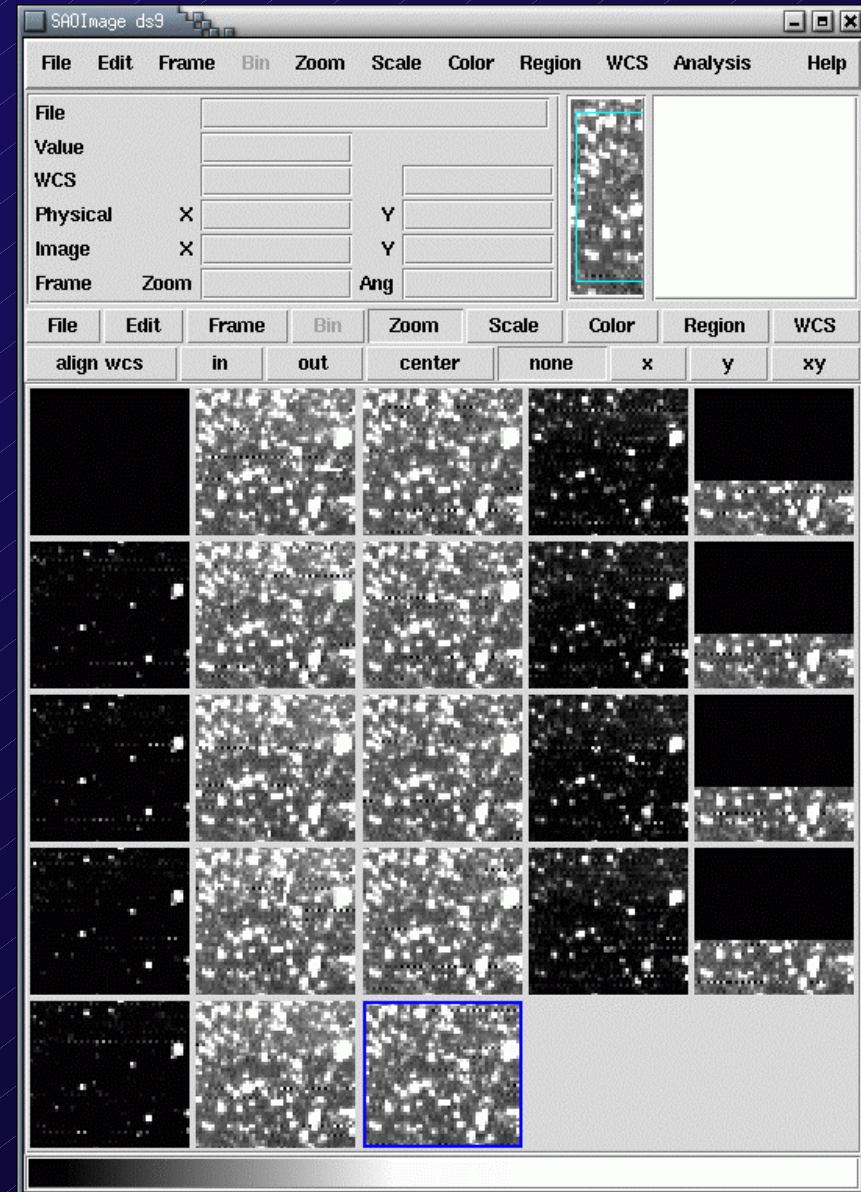
Summary of 005800090010.fits in /pcdisk/kafka2/risquez/talkGeneva/mosaic/obs/GRO_J0852-46_000/

Index	Extension	Type	Dimension	View
<input type="checkbox"/> 0	Primary	Image	0	Header Image Table
<input type="checkbox"/> 1	GROUPING	Binary	25 cols X 23 rows	Header Hist Plot All Select
<input type="checkbox"/> 2	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 3	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 4	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 5	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 6	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 7	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 8	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 9	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 10	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 11	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 12	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 13	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 14	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 15	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 16	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 17	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 18	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 19	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 20	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table
<input type="checkbox"/> 21	OMC.-SKY.-IMA	Image	1072 X 1028	Header Image Table



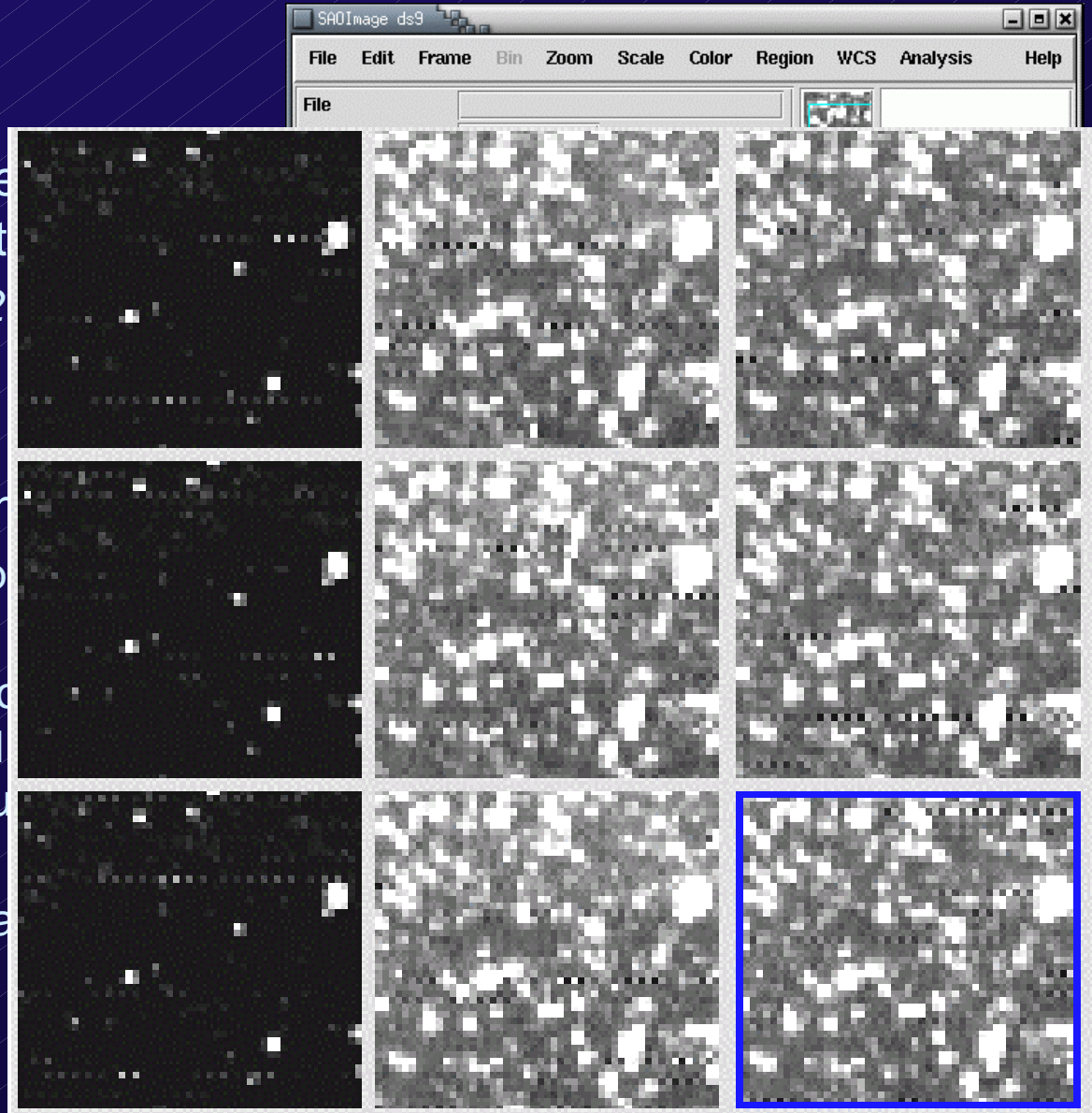
Mosaics III

- Search mosaic coordinates with *ds9* or *fv*, and use *IRAF* to cut images.
 - `imcopy infile[923:977,32:86] outfile`
- Use the same method as in trigger mode.
- Some interesting questions:
 - Usually the first shot is photometric. It has no science data.
 - Look the background. You can see the *EXPOSURE* cycle: 100, 100, 30, 100, and 10 seconds (currently 10, 50, 200 seconds).
 - Look the readout noise and its typical horizontal lines.



Mosaics IV

- Search mosaic coordinates or *fv*, and use *IRAF* to cut
 - `imcopy infile[923:977,32`
- Use the same method as mode.
- Some interesting questions
 - Usually the first shot is p. It has no science data.
 - Look the background. You the *EXPOSURE* cycle: 1, 100, and 10 seconds (cut 50, 200 seconds).
 - Look the readout noise a typical horizontal lines.



- These are a few examples, but new OMC light curves are waiting for you...