



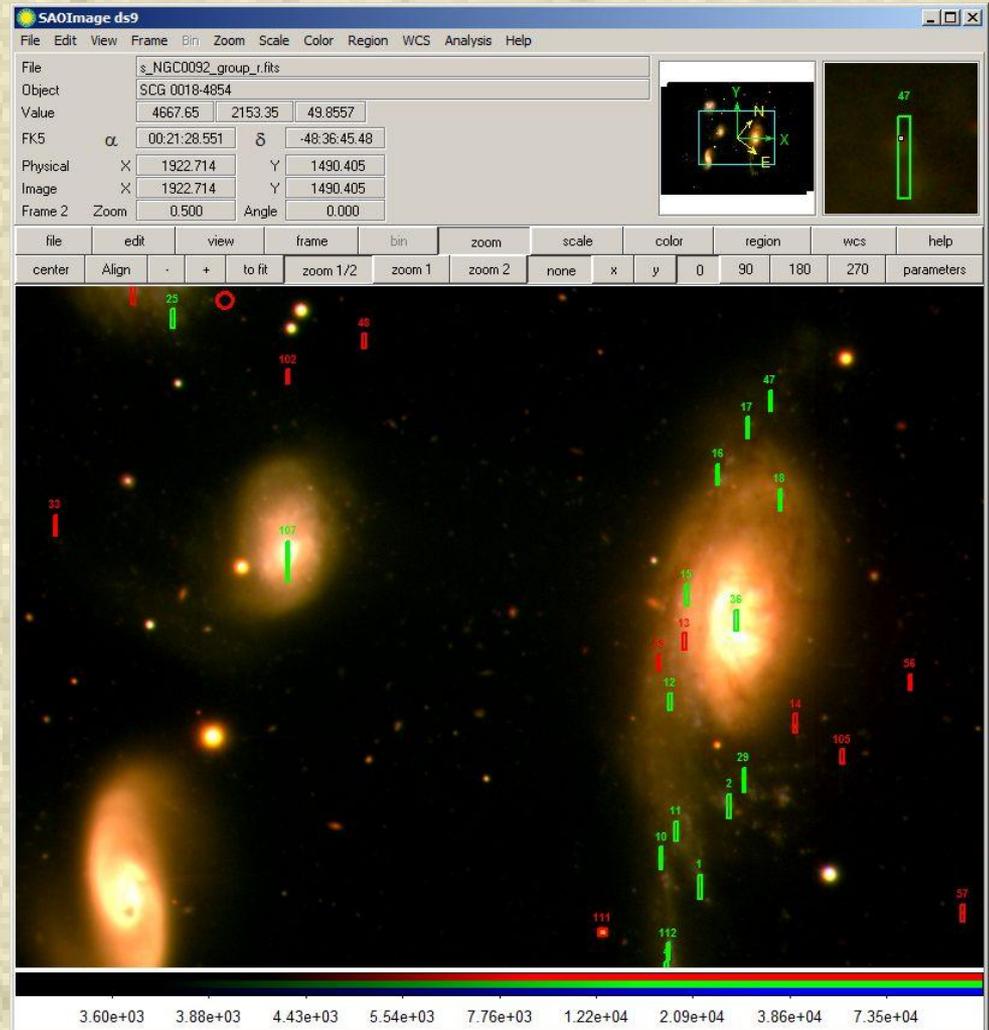
**Ferramentas para Solicitação e**  
**Verificação de Observações:**  
**DS9 e SKYCALC**

**Sergio**  
**Searano Jr**  
10/000010

# O DS9

Aplicativo desenvolvido pela SÃO par visualização 2D e 3D de arquivos FITS em seus mais diferentes “sabores”. Poderoso por permitir:

- Comunicação direta com ferramentas externas de análise;
- O uso de regiões para medir, marcar, delimitar, comparar, extrair dados, etc;
- Utilizar ferramentas básicas de análise, como sobreposição de contornos, suavização, geração de tabela de píxeis;
- Acesso a banco de imagens, “Archives” e catálogos compatível com o protocolos VO;
- Sobrepôr diversas imagens em frames, canais, mosaicos e manipulá-los em termos de escala de intensidades, cores, zoom, orientação, sistema de coordenadas;
- Muito mais....



<http://hea-www.harvard.edu/PD/ds9/site/Home.html>





**Preparativos para um  
Pedido de Observação**

# Verificando a “Observabilidade”

Por “observabilidade” compreendemos o conjunto de condições necessárias para que uma observação possa ser feita eficientemente.

The screenshot displays the JskyCalc software interface, which is used for astronomical observations. The main window is titled "JskyCalc v1.2.1: John Thorstensen, Dartmouth College". It contains a grid of input fields for various parameters, including Object, RA, Dec, Equinox, Date, Time, Time is (Local/UT), timestep, sleep for (s), JD, Site name, Longitude, Latitude, Time zone, DST code, Zone name, Elevation, Terrain elev, Sidereal, HA, Airmass, AltAz, parallactic, SunRAdec, SunAltAz, ZTwilight, MoonPhase, MoonRAdec, MoonAltAz, MoonIllumFrac, LunSkyBrgh, Moon-Obj ang, Bary. JD, Bary. Vcorn., Constellation, and Planet Warning?.

Below the input fields are several buttons for actions like "Refresh output", "Set to Now", "Step Forward", "Step Back", "Auto Update", "Auto Step", "Site Menu", "Planet Table", "Hourly Circumstances", "Nightly Almanac", "Seasonal Observability", "Object Lists...", "Sky Display", "Alt. Coordinates", "Airmass Graphs", "Quit", and "Help".

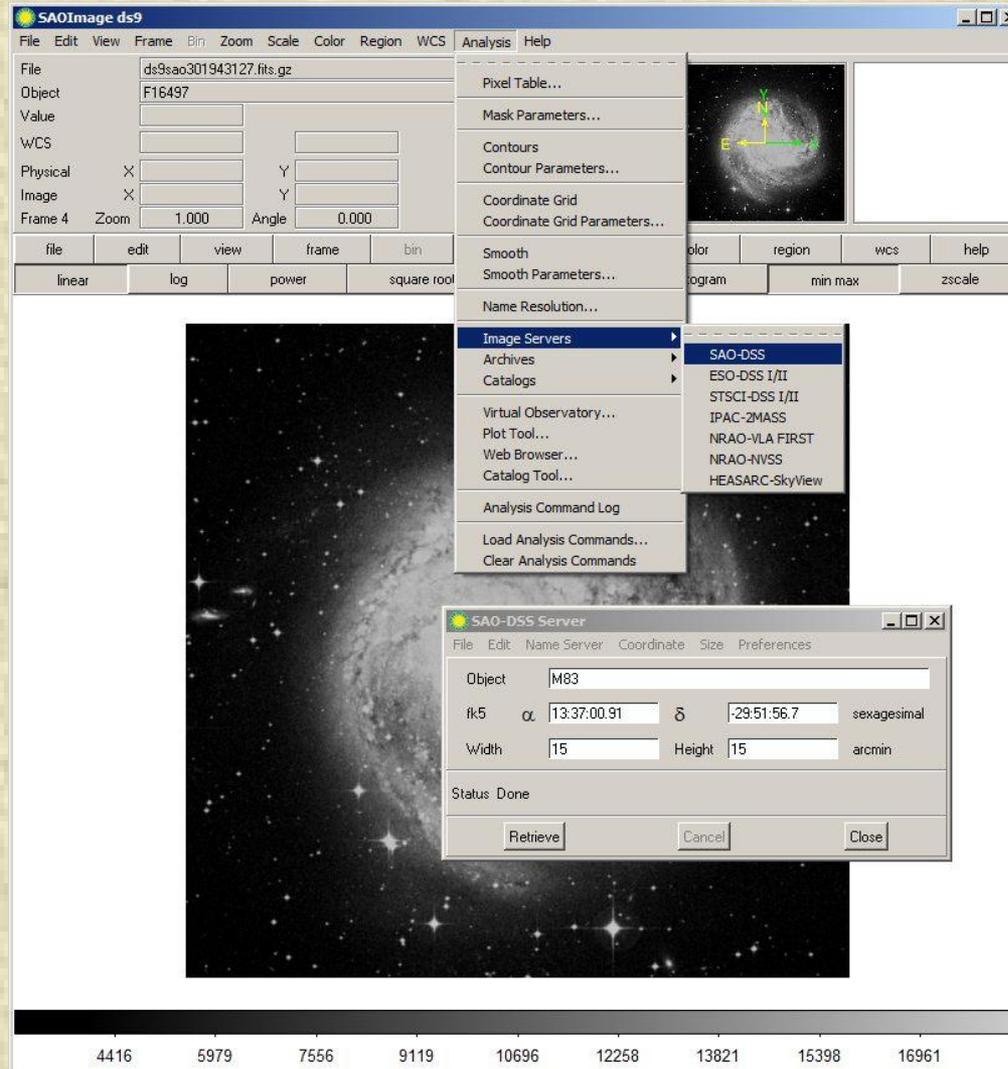
To the right of the main window is a "Airmass Graph Sel" window, which lists various observatories with radio buttons for selection. The selected observatory is "Gemini South, Pachon". Below the list are buttons for "Load Object List", "Sort by RA", "Alphabetical Order", "Clear list", "Plot airmasses", "Deselect all", and "Hide Window".

At the bottom of the screen is a "Airmass Display" window, which shows a graph of Airmass (left y-axis, 1.0 to 3.0) and Moon Altitude [deg] (right y-axis, 0 to 90) versus Local time (bottom x-axis, 19 to 07) and UT (top x-axis, 23 to 11). The graph shows a curve representing the airmass over time, and a small icon of the moon is visible in the upper right corner of the plot area.

In the background, a Mozilla Thunderbird email window is visible, showing an email from gemini.secop@lna.br with the subject "Gemini - semestre 2013A". The email content reads: "O Escritório Brasileiro do Gemini (BrGO/LNA) comunica a chamada para propostas para os telescópios Gemini para o semestre 2013A (período de 01/02/2013 a 31/07/2013)."

# Carregando Uma Imagem de um “Servidor de Imagens”

Necessidades: Acesso a rede; nome do objeto ou suas coordenadas.



# Acesso aos “Archives”

Conhecimentos envolvidos: Utilização do navegador interno.

The screenshot displays the SAOImage ds9 software interface. The main window shows a large astronomical image of a galaxy with a coordinate grid. A menu is open, highlighting the 'Archives' option. Below the menu, a table lists various astronomical data files. The table has columns for file size, type, actions, image thumbnails, and other metadata.

22069KB FITS image <a href="#">Retrieve</a>	<a href="#">Display</a> FITS Header		Ha , 6568A	16.8 x 16.8	1.56
22069KB FITS image <a href="#">Retrieve</a>	<a href="#">Display</a> FITS Header		Ha-R , 6568A	16.8 x 16.8	1.56
123KB JPG image <a href="#">Retrieve</a>	N/A	N/A	Ha-R , 6568A	16.8 x 16.8	1.56
22069KB FITS image <a href="#">Retrieve</a>	<a href="#">Display</a> FITS Header		R , 6507A	16.8 x 16.8	1.57

Back to NED Home

4416 5979 7556 9119 10696

# Manipulando múltiplos "Frames"

Conhecimentos envolvidos: Abrir e deletar frames, manipular escala de intensidades e cores, controlar alinhamento de imagens.

The screenshot displays the SAOImage ds9 software interface, which is used for astronomical image processing. The main window shows two side-by-side images of a galaxy, with the right image being a processed version of the left one. The interface includes a menu bar (File, Edit, View, Frame, Bin, Zoom, Scale, Color, Region, WCS, Analysis, Help) and a toolbar with various icons for file operations, editing, and viewing. A panel on the left contains fields for file name, object name, value, WCS coordinates, and physical image parameters. A central panel shows a small thumbnail of the galaxy with a crosshair and a coordinate system. A right-hand panel contains a list of frames and a menu for frame manipulation. A bottom panel shows a pixel distribution histogram with a red vertical line indicating a specific intensity value. The histogram is titled "Pixel Distribution" and shows a distribution of pixel intensities. The x-axis is labeled "Pixel Distribution" and has values 0, 19.767, 39.534, 59.301, and 79.068. The y-axis is labeled "Pixel Distribution" and has values 0, 19.767, 39.534, 59.301, and 79.068. The histogram shows a peak at approximately 19.767. The "Low" value is set to 0 and the "High" value is set to 88.926071. The "Apply" button is visible at the bottom of the histogram panel.

SAOImage ds9

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

File ds9sao301943127.fits.gz

Object F16497

Value

WCS

Physical X Y

Image X Y

Frame 4 Zoom 1.000 Angle 0.000

file edit view frame bin zoom scale color region wcs help

new new rgb delete clear single tile blink match frames match colorbars first previous next last

Frame

New Frame

New Frame RGB

Delete Frame

Delete All Frames

Clear Frame

Reset Frame

Refresh Frame

Single Frame

Tile Frames

Blink Frames

Match

Lock Crosshair

Goto Frame

Show/Hide Frames

Move Frame

First Frame

Previous Frame

Next Frame

Last Frame

Data Cube...

RGB...

Frame Parameters

Frame

Colorbar

Scale

Bin

WCS

Image

Physical

Amplifier

Detector

Pixel Distribution

0 19.767 39.534 59.301 79.068

Low 0 High 88.926071

Apply Close

# Abrindo Arquivos Armazenados em Disco

Conhecimentos envolvidos: Abrir novos frames, abrir diferentes tipos de arquivos fits, manipulação de frame

The image shows a Gemini Science Archive browser window on the left and the SAOImage ds9 software interface on the right. The browser window displays a table of astronomical data with columns for Mark, Target Name, RA (J2000), DEC (J2000), Data Superset Name, and Original File Name. The SAOImage ds9 window shows a multi-panel view of a galaxy, with a central panel displaying a zoomed-in view of the nucleus. The software interface includes a menu bar (File, Edit, View, Frame, Bin, Zoom, Scale, Color, Region, WCS, Analysis, Help) and a toolbar with various image manipulation tools. The main display area shows a grid of galaxy images, with the central panel showing a zoomed-in view of the nucleus. The zoom level is 0.123 and the angle is 0.000. The file name is mrgS20070807S0046\_add.fits.gz[SCI].

Mark	Target Name	RA (J2000)	DEC (J2000)	Data Superset Name	Original File Name
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-001-mrg	MRGS20070807S0046
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-011	S20070807S0056
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-011-mrg	MRGS20070807S0056
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-006	S20070807S0051
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-001	S20070807S0046
<input checked="" type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-001-mrg-add	MRGS20070807S0046
<input type="checkbox"/>	Nucleus	13 37 00.95	-29 51 55.4	GS-2007A-DD-17-28-006-mrg	MRGS20070807S0051

# Acessando Catálogos

Conhecimentos envolvidos: Ferramenta para acessar catálogos, manipulação da ferramenta de catálogos; sobreposição de objetos na imagem, gerar e manipular regiões.

The screenshot displays the SAOImage ds9 software interface. The main window shows a galaxy image with several green circles overlaid, indicating regions of interest. The 'Search for Catalogs' dialog is open, showing a search for 'M83'. The 'Catalog Tool' dialog is also open, displaying a table of catalog entries for M83.

**Search for Catalogs Dialog:**

- Name or Designation: M83
- Wavelength: optical
- Mission: Chandra
- Astronomy: Planetary\_Nebulae

**Catalog Tool Dialog:**

R/R25	XUV	F[OII]	e_F[OII]	F[OIII]		
1.28		716	86	593		
1.15				21		
1.16				99		
1.17		265	26	248		
1.04				11		
204.19396	-29.77792	10	1.03	338	21	121
204.19479	-29.74500	11	1.32	509	78	36
204.19879	-29.77447	12	1.04	639	109	57
204.20450	-29.93414	13	0.76	214	19	108
204.20862	-29.93131	14	0.72	113	7	14
204.21292	-29.93697	16	0.75	94	6	0
204.22121	-29.93056	17	0.67	211	12	44
204.22600	-29.78717	18	0.82	206	25	22
204.22829	-29.78533	19	0.83	216	22	58
204.23062	-29.79225	21	0.76	184	17	42
204.23183	-29.79378	22	0.74	185	20	17
204.23204	-29.92956	23	0.64	128	7	50

**Log Window:**

```
14 - Compass
15 - Tamanho de
16
17 - Acompanhando observações e verificação dos dados
18 - Procedimentos para verificar se observações foram feitas de
    acordo
19 - com solicitações
20 - Angulo paralatico
21 - Condições de Lua (sky background, distância);
22 - Uso do arquivo de log.
23
```

# Trabalhando com Regiões

Conhecimentos envolvidos: Editar parâmetros de regiões geradas com os catálogos e salvar resultado.

The screenshot displays the SAOImage ds9 software interface. The main window shows a galaxy image with several regions marked by colored circles. A 'Save Regions' dialog is open, showing the 'Format' set to 'xy' and 'Coordinate System' set to 'wcs'. A 'Circle Point' dialog is also open, showing the 'Number' 289 and 'Text' 'Bre+2009\_2'. The 'Circle Point' dialog has 'Center' coordinates of 204.25162 and -29.79608, and a 'Size' of 11. The 'Save Regions' dialog has 'Format' set to 'xy' and 'Coordinate System' set to 'wcs'. The 'Circle Point' dialog has 'Number' 289 and 'Text' 'Bre+2009\_2'. The 'Circle Point' dialog has 'Center' coordinates of 204.25162 and -29.79608, and a 'Size' of 11. The 'Save Regions' dialog has 'Format' set to 'xy' and 'Coordinate System' set to 'wcs'. The 'Circle Point' dialog has 'Number' 289 and 'Text' 'Bre+2009\_2'. The 'Circle Point' dialog has 'Center' coordinates of 204.25162 and -29.79608, and a 'Size' of 11.

The 'Save Regions' dialog shows the following options:

- Format: xy
- Coordinate System: wcs
- Buttons: OK, Cancel

The 'Circle Point' dialog shows the following options:

- Number: 289
- Text: Bre+2009\_2
- Center: 204.25162, -29.79608
- Size: 11
- Buttons: Apply, Close

The 'Save Regions' dialog also shows the following options:

- Coordinate System: wcs
- Buttons: OK, Cancel

The 'Circle Point' dialog also shows the following options:

- Buttons: Apply, Close

The 'Save Regions' dialog also shows the following options:

- Buttons: OK, Cancel

The 'Circle Point' dialog also shows the following options:

- Buttons: Apply, Close

Pasta1 - Microsoft Excel

	A	B	C	D	E	F	G	H	I
196	13:37:15.1	-29:50:40.1	n	SNR?;WR?					
197	13:37:16.1	-29:48:35.1	n	AGN?;WR?					
198	13:37:16.6	-29:50:59.1	n	SNR?					
199	13:37:17.8	-29:51:55.1	n	SNR?;WR?					
200	13:37:17.9	-29:48:04.1	n	WR					
201	13:37:23.6	-29:48:53.1	n	WR					
202									
203									
204									

Pronto Contagem: 400 100%

# Trabalhando com Regiões – Abrir Lista Personalizada

Conhecimentos envolvidos: Editar parâmetros de regiões geradas com os catálogos e salvar resultado. Selecionar tudo, deletar regiões.

The screenshot displays the SAOImage ds9 software interface. The main window shows a star field with a green dashed circle region. A 'Load Regions' dialog box is open, showing options for Format (xy), Coordinate System (wcs), and Load into Current Frame. The 'Region' panel on the right shows a list of regions with their coordinates and names. The 'WCS' panel shows the current coordinate system settings.

**Load Regions Dialog Box:**

- Format: xy
- Coordinate System: wcs
- Load into Current Frame (selected)
- Load into All Frames

**Region Panel:**

- Get Information...
- Shape
- Composite Region
- Instrument FOV
- Template
- Color
- Width
- Properties
- Font
- Centroid
- Move to Front
- Move to Back
- Select All (Control-A)
- Select None
- Invert Selection
- Delete Selected Regions
- Delete All Regions
- New Group
- Groups...
- List Regions...
- Load Regions...
- Save Regions...
- Region Parameters

**WCS Panel:**

- Equatorial B1950
- Equatorial J2000
- ICRS
- Galactic
- Ecliptic
- Degrees
- Sexagesimal (checked)

**Region List:**

Region Name	RA (h m s)	Dec (d m s)
Bre09_38(+54+300)	13:36:40.35	-29:51:06.7
Bre09_12(-198+328)	13:36:41.50	-29:52:16.0
Bre09_40(-215+315)	13:36:42.33	-29:52:17.3
Bre09_19(-307+282)	13:36:42.73	-29:52:34.9
Bre09_24(-38+264)	13:36:43.70	-29:50:45.9
Bre09_34(-8+250)	13:36:43.83	-29:52:11.3
WSS3_18(+66+108)	13:36:44.65	-29:50:34.2
WSS3_17(+89+66)	13:36:45.31	-29:53:07.7
WSS3_7(+102+60)	13:36:45.70	-29:52:20.9
WSS3_13(+133+143)	13:36:45.93	-29:53:34.4
WSS3_11(+143+143)	13:36:46.42	-29:53:42.3
WSS3_14(+143+143)	13:36:46.93	-29:46:41.9
WSS3_15(+143+143)	13:36:47.13	-29:55:31.7
WSS3_16(+143+143)	13:36:47.18	-29:53:51.4
WSS3_18(+143+143)	13:36:47.22	-29:53:36.9
Bre09_46(+148-229)	13:36:48.33	-29:51:06.7
Bre09_23(+230+230)	13:36:48.33	-29:51:06.7
Bre09_43(+230+230)	13:36:48.33	-29:51:06.7
Bre09_44(+120-284)	13:36:48.33	-29:51:06.7
Bre09_45(+133-428)	13:36:48.33	-29:51:06.7
Bre09_43(+110-444)	13:36:48.33	-29:51:06.7
Bre09_29(+36-449)	13:36:48.33	-29:51:06.7
Bre09_36(+4-315)	13:36:48.33	-29:51:06.7
Bre09_45(+6-327)	13:36:48.33	-29:51:06.7
Bre09_49(+277-344)	13:36:48.33	-29:51:06.7
Bre09_47(+172-357)	13:36:48.33	-29:51:06.7
Bre09_45(+133-428)	13:36:48.33	-29:51:06.7
Bre09_43(+110-444)	13:36:48.33	-29:51:06.7
Bre09_29(+36-449)	13:36:48.33	-29:51:06.7
Bre09_38(+61-470)	13:36:48.33	-29:51:06.7
Bre09_41(+36-484)	13:36:48.33	-29:51:06.7
Bre09_40(+74-495)	13:36:48.33	-29:51:06.7

# Trabalhando com Regiões – Trabalhando com Grupos

Conhecimentos envolvidos: Criar grupos, selecionar e inverter seleção de grupos.

The screenshot displays the SAOImage ds9 interface. The main window shows a star field with a large green dashed circle region. Numerous objects are labeled with names and coordinates, such as Bre09\_12(-198+328), Bre09\_38(+54+300), and WS83\_17(+225+66). The interface includes a menu bar (File, Edit, View, Frame, Bin, Zoom, Scale, Color, Region, WCS, Analysis, Help), a toolbar with icons for file operations, a left sidebar with physical and image properties, and a right sidebar with a 'Region' panel and a 'Groups' panel.

**Region Panel:**

- Get Information...
- Shape
- Composite Region
- Instrument FOV
- Template
- Color
- Width
- Properties
- Font
- Centroid
- Move to Front
- Move to Back
- Select All
- Select None
- Invert Selection**
- Delete Selected Regions
- Delete All Regions
- New Group
- Groups...
- List Regions...
- Load Regions...
- Save Regions...
- Region Parameters

**Groups Panel:**

File	RA	Dec
BK02		:51:35.2
Bre02		:51:06.7
Bre09		:52:16.0
Corotation		:49:56.4
DTJ80		:52:17.3
WS83		:52:34.9
		:50:45.9
		:52:11.3
		:50:34.2
		:53:07.7
		:52:20.9
		:53:34.4
		:53:42.3
		:46:41.9
15	13:36:47.13	-29:55:31.7
16	13:36:47.18	-29:53:51.4
17	13:36:47.22	-29:53:36.9

Ln : 1 Col : 1 Dos/Windows ANSI INS

# Exemplo de Finding Chart

Conhecimentos envolvidos: Criar regiões, girar, medir ângulos com a régua, copiar e colar regiões, inverter escala de cores, exportar imagem.

The screenshot displays the SAOImage ds9 software interface. The main window shows a grayscale astronomical image with a blue rectangular region and a red circle around a point labeled "PN d0 Oscar". A scale bar at the bottom right indicates "1 arcmin". The interface includes a menu bar (File, Edit, View, Frame, Bin, Zoom, Scale, Color, Region, WCS, Analysis, Help), a menu, a toolbar, and several panels.

**Region Panel:**

- Get Information...
- Shape
- Composite Region
- Instrument FOV
- Template
- Color
- Width
- Properties
- Font
- Centroid
- Move to Front
- Move to Back
- Select All (Control-A)
- Select None
- Invert Selection
- Delete Selected Regions
- Delete All Regions
- New Group
- Groups...
- List Regions...
- Load Regions...
- Save Regions...
- Region Parameters

**Shape Panel:**

- Circle
- Ellipse
- Box
- Polygon
- Line
- Vector
- Text
- Ruler
- Compass
- Projection
- Annulus
- Elliptical Annulus
- Box Annulus
- Panda
- Elliptical Panda
- Box Panda
- Circle Point
- Box Point
- Diamond Point
- Cross Point
- X Point
- Arrow Point
- BoxCircle Point

**Region Parameters Panel:**

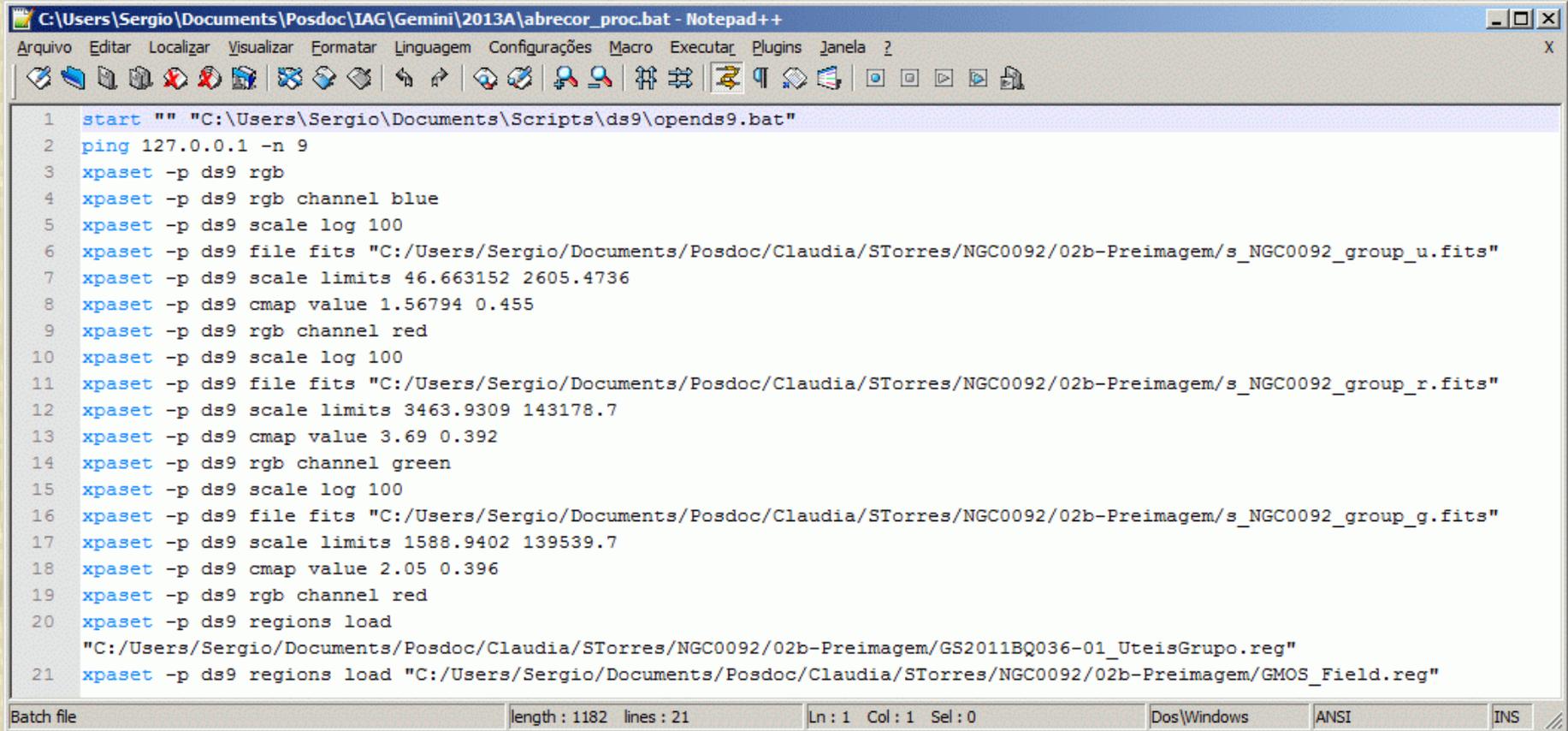
Number	Center X	Center Y	Width	Height	Angle
615	204.25609	-29.849664	3	185.79	fk:5

**Coordinate Table:**

Number	RA (h:m:s)	Dec (d:m:s)
9	13:36:44.65	-29:50:34.2
10	13:36:45.31	-29:53:07.7
11	13:36:45.70	-29:52:20.9
12	13:36:45.93	-29:53:34.4
13	13:36:46.42	-29:53:42.3
14	13:36:46.93	-29:46:41.9
15	13:36:47.13	-29:55:31.7
16	13:36:47.18	-29:53:51.4
17	13:36:47.22	-29:53:36.9

# Uso de Comandos XPA

O XPA é uma linguagem de comunicação que permite conectar os mais diferentes aplicativos com o DS9.



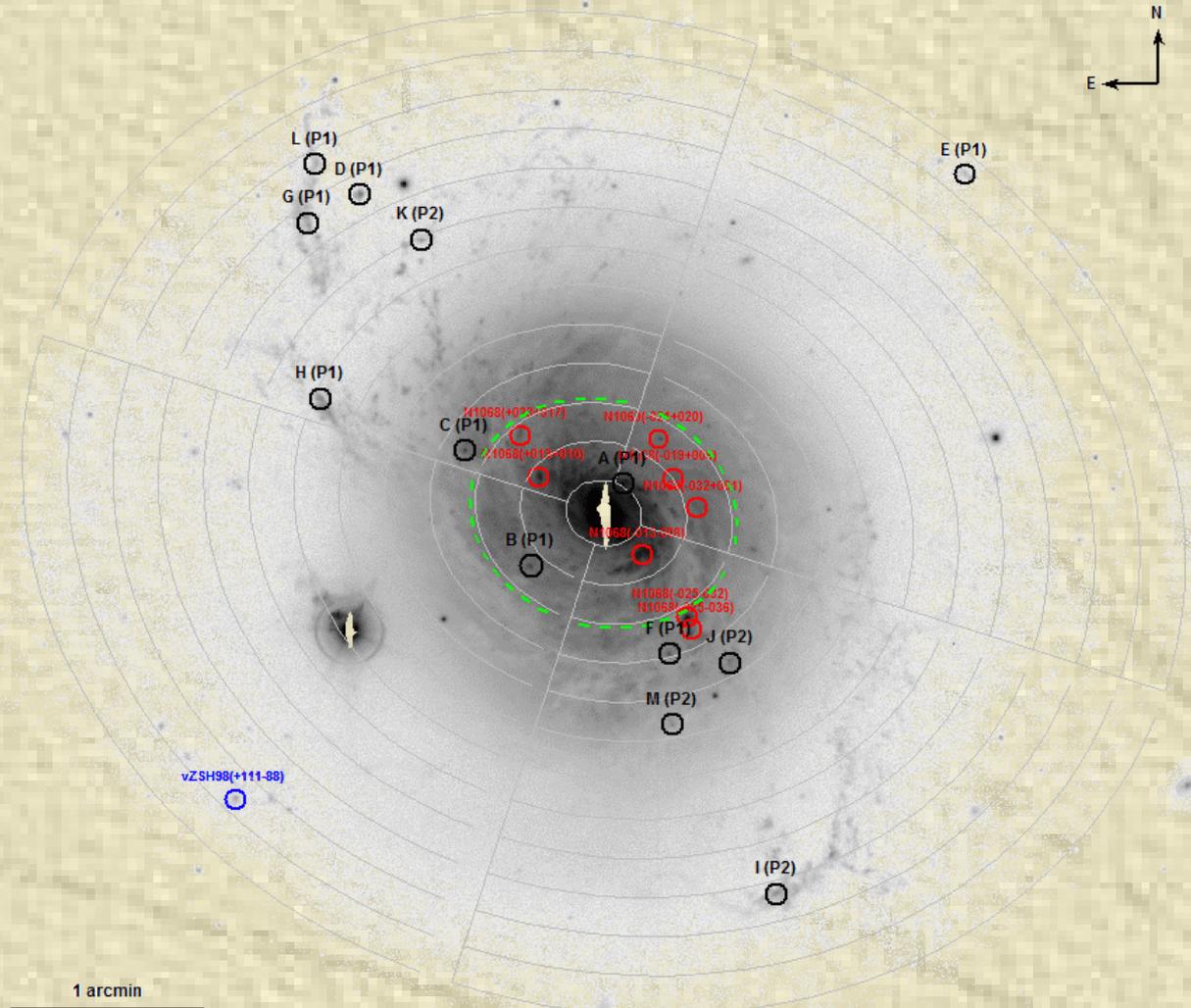
```
C:\Users\Sergio\Documents\Posdoc\IAG\Gemini\2013A\abrecor_proc.bat - Notepad++
Arquivo Editar Localizar Visualizar Formatar Linguagem Configurações Macro Executar Plugins Janela ?
1 start "" "C:\Users\Sergio\Documents\Scripts\ds9\opens9.bat"
2 ping 127.0.0.1 -n 9
3 xpaset -p ds9 rgb
4 xpaset -p ds9 rgb channel blue
5 xpaset -p ds9 scale log 100
6 xpaset -p ds9 file fits "C:/Users/Sergio/Documents/Posdoc/Claudia/STorres/NGC0092/02b-Preimagem/s_NGC0092_group_u.fits"
7 xpaset -p ds9 scale limits 46.663152 2605.4736
8 xpaset -p ds9 cmap value 1.56794 0.455
9 xpaset -p ds9 rgb channel red
10 xpaset -p ds9 scale log 100
11 xpaset -p ds9 file fits "C:/Users/Sergio/Documents/Posdoc/Claudia/STorres/NGC0092/02b-Preimagem/s_NGC0092_group_r.fits"
12 xpaset -p ds9 scale limits 3463.9309 143178.7
13 xpaset -p ds9 cmap value 3.69 0.392
14 xpaset -p ds9 rgb channel green
15 xpaset -p ds9 scale log 100
16 xpaset -p ds9 file fits "C:/Users/Sergio/Documents/Posdoc/Claudia/STorres/NGC0092/02b-Preimagem/s_NGC0092_group_g.fits"
17 xpaset -p ds9 scale limits 1588.9402 139539.7
18 xpaset -p ds9 cmap value 2.05 0.396
19 xpaset -p ds9 rgb channel red
20 xpaset -p ds9 regions load
"C:/Users/Sergio/Documents/Posdoc/Claudia/STorres/NGC0092/02b-Preimagem/GS2011BQ036-01_UteisGrupo.reg"
21 xpaset -p ds9 regions load "C:/Users/Sergio/Documents/Posdoc/Claudia/STorres/NGC0092/02b-Preimagem/GMOS_Field.reg"
Batch file length : 1182 lines : 21 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS
```

**Verificação dos Dados**



# Observação de Regiões HII no SOAR

Exemplo de observação da galáxia NGC1068 para o meu projeto SO2012B-017.



# Verificando o Header

Conhecimentos envolvidos: Abrir e localizar informações no header.

The screenshot displays the SAOImage ds9 interface. The main window shows a dark astronomical image with a white crosshair. On the left, there are control panels for File, Object, WCS, Physical, Image, Frame, Zoom, and Angle. On the right, there are panels for Region and Shape. A window titled '0126.S02012B-017\_0910.fits' is open, displaying the FITS header information. A 'Search' dialog box is also open, with the search expression 'airmass' entered.

```
0126.S02012B-017_0910.fits
File Edit
SIMPLE = T / FITS Standard
BITPIX = 16 / FITS Bits/Pixel (-16 signifies [U16])
NAXIS = 3 / Number of Axes
NAXIS1 = 4142 / Length of Axis 1 (Columns)
NAXIS2 = 1896 / Length of Axis 2 (Rows)
NAXIS3 = 1 / # of Frames
BSCALE = 1 / Scaling Factor (Default=1)
BZERO = 32768 / Offset Factor (Default=0)
DATE-OBS= '2012-09-11T07:45:53.50' / DATE-OBS Format is YYYY-MM-DDThh:mm:ss.ss
DATE = '2012-09-11' / Date Format is YYYY-MM-DD
TIME = '07:45:53.50 to 07:55:53.81' / ~ Start & Stop of Exposure
N_PARAM = 80 / Number of Parameters
PARAM0 = -106.3 / CCD Temperature, °C
PARAM1 = 0 / Not Used
PARAM2 = 0.000 / CCD Chamber Pressure, Torr
PARAM3 = 0 / Not Used
PARAM4 = 0 / Not Used
PARAM5 = 0 / Not Used
PARAM6 = 0 / Not Used
PARAM7 = 0 / Not Used
PARAM8 = 0 / Shutter Status
PARAM9 = 0 / XIRQA Status
PARAM10 = 1 / Cooler Status
PARAM11 = 0 / Not Used
PARAM12 = 0 / Not Used
PARAM13 = 0 / Not Used
PARAM14 = 0 / Not Used
PARAM15 = 0 / Not Used
PARAM16 = 0 / Serial Origin, Pixels
PARAM17 = 4142 / Serial Length, Binned Pixels
PARAM18 = 1 / Serial Binning, Pixels
PARAM19 = 0 / Serial Post Scan, Pixels
PARAM20 = 1100 / Parallel Origin, Pixels
PARAM21 = 1896 / Parallel Length, Binned Pixels
PARAM22 = 1 / Parallel Binning, Pixels
PARAM23 = 0 / Parallel Post Scan, Pixels
PARAM24 = 600000 / Exposure Time, ms
PARAM25 = 0 / Continuous Clear, (Enabled)
PARAM26 = 330 / DSI Sample Time, (100 KHz)
PARAM27 = 3 / Analog Attenuation, (High)
```

Search dialog box:  
Enter Search Expression  
airmass  
OK Cancel

# Conferindo Condições Observacionais com SKYCALC

Conhecimentos envolvidos: Exibição de lista de objetos, mudar para UT.

The screenshot displays the JskyCalc software interface, which is used for astronomical observations. The main window is titled "JskyCalc v1.2.1: John Thorstensen, Dartmouth College". It features a sidebar with various observation parameters, a central "Object Selector" window, and a main display area.

**Object Selector:** This window shows a list of objects for selection. The objects listed are:

- 017-NGC1068-E
- 017-NGC1068-F
- 017-NGC1068-G
- 017-NGC1068-H
- 017-NGC1068-I
- 017-NGC1068-J
- 017-NGC1068-K
- 017-NGC1068-L

Buttons for "Load Object List", "Sort by RA", "Alphabetical Order", "Clear list", and "Hide Window" are visible below the list.

**Airmass Graph:** This window displays a graph titled "SOAR, Pachon - Evening date 2012 Sep 10 Mon". The x-axis represents time in UT (00 to 10) and Local (19 to 06). The y-axis represents Airmass (1.0 to 3.0) and Moon Altitude [deg] (0 to 90). A red curve shows the airmass increasing over time, and a yellow crescent moon is visible in the sky.

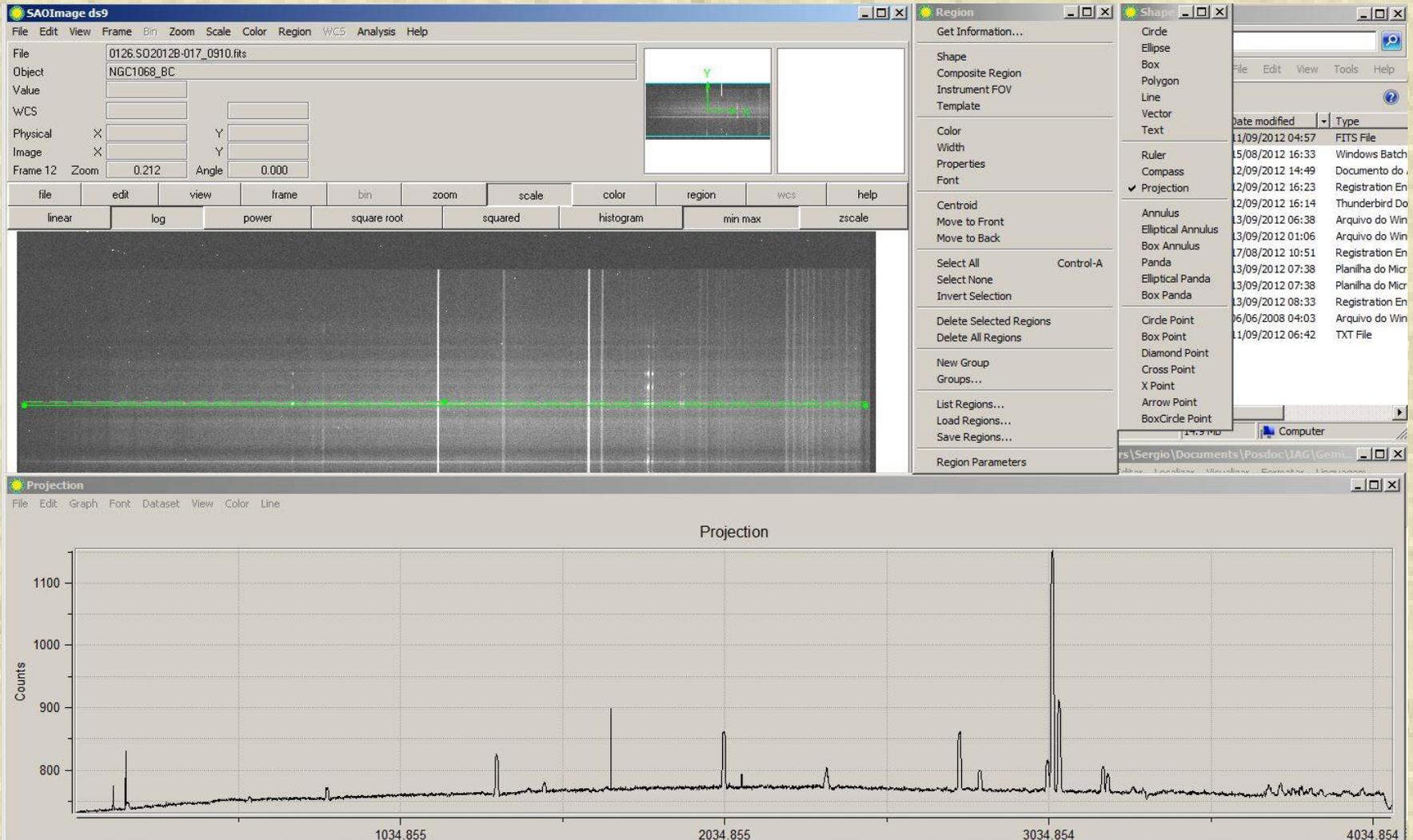
**Main Window:** The main window contains a sidebar with various observation parameters, including Object, RA, Dec, Date, Time, and Site information. It also features buttons for "Refresh output", "Set to Now", "Step Forward", "Step Back", "Auto Update", "Auto Step", "Site Menu", "Planet Table", "Hourly Circumstances", "Nightly Almanac", "Seasonal Observability", "Object Lists...", "Sky Display", "Alt. Coordinates", "Airmass Graphs", "Quit", and "Help".

**File Edit:** The bottom window shows the file "0126.S02012B-017\_0910.fits" with the following parameters:

```
NAXIS2 = 1896 / Length of Axis 2 (Rows)
NAXIS3 = 1 / # of Frames
BSCALE = 1 / Scaling Factor (Default=1)
BZERO = 32768 / Offset Factor (Default=0)
DATE-OBS = '2012-09-11T07:45:53.50' / DATE-OBS Format is YYYY-MM-
DATE = '2012-09-11' / Date Format is YYYY-MM-DD
TIME = '07:45:53.50 to 07:55:53.81' / ~ Start & Stop of Expos
N_PARAM = 80 / Number of Parameters
PARAM0 = -106.3 / CCD Temperature, °C
PARAM1 = 0 / Not Used
```

# Verificando Espectroscopia com o DS9

Conhecimentos envolvidos: Região de projeção, integração do fluxo, exibição e controle de gráfico.



# Verificando Imageamento de Mosaico feito com SPARTAN

Conhecimentos envolvidos: Abrir imagens como segmentos de mosaicos, alinhados pelo WCS. Programa SO2012B-016:

