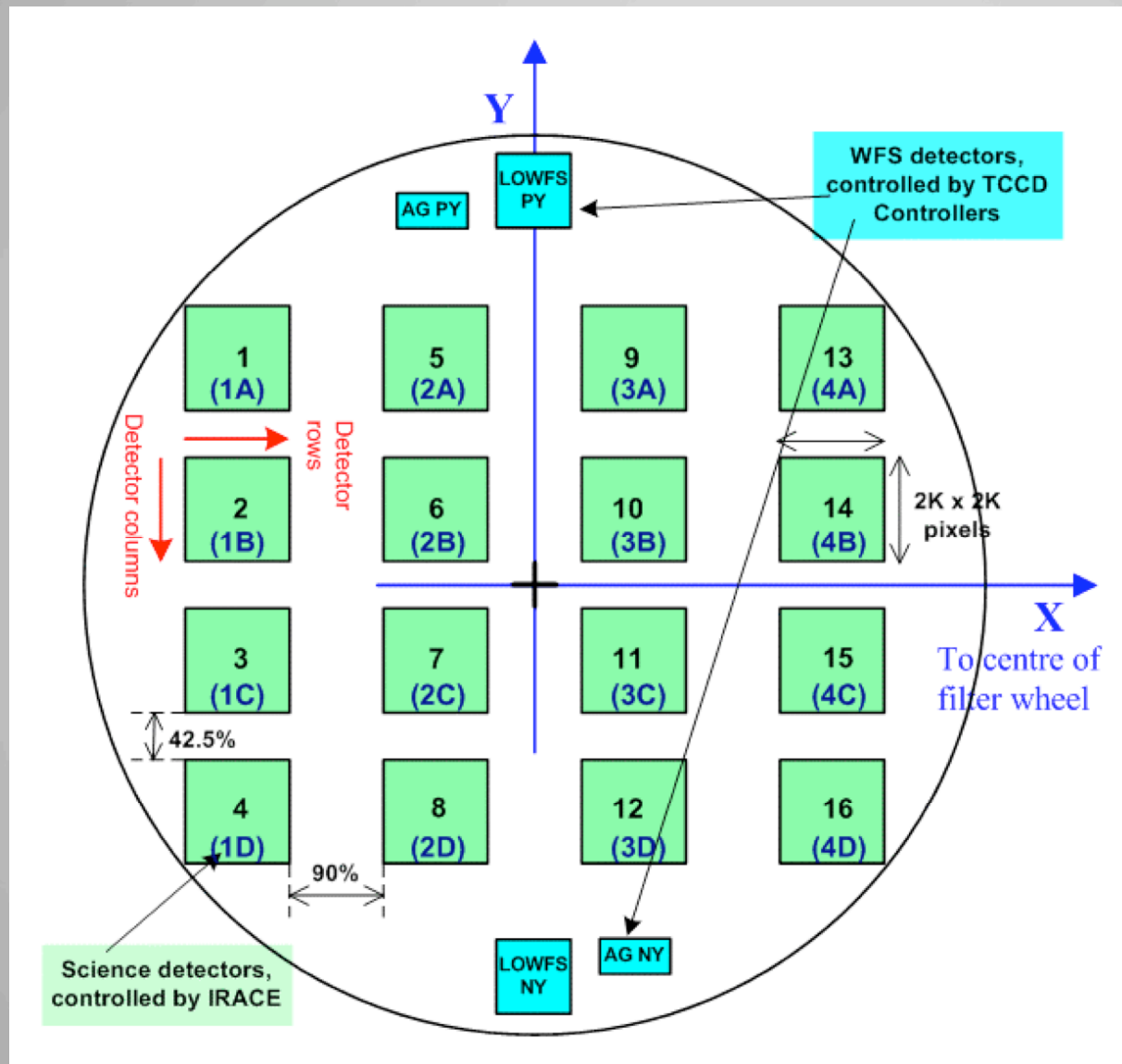


Survey Area DefinitionTool

Jim Emerson

Queen Mary, University of London

Focal plane layout



SADT Purposes

- 1) to generate the pointing position for each tile making up a survey.
- 2) to find the (6) sets of guide and active optics (aO) stars necessary to observe each survey tile.
- 3) to output the results in a form that can be used in the Phase2 Preparation Program (P2PP) to generate the OBs ready to await scheduling for execution.

Read the Manual first

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<http://www.vista.ac.uk/observing/sadt/>

Survey Areas & Tile Centres

Generation -1

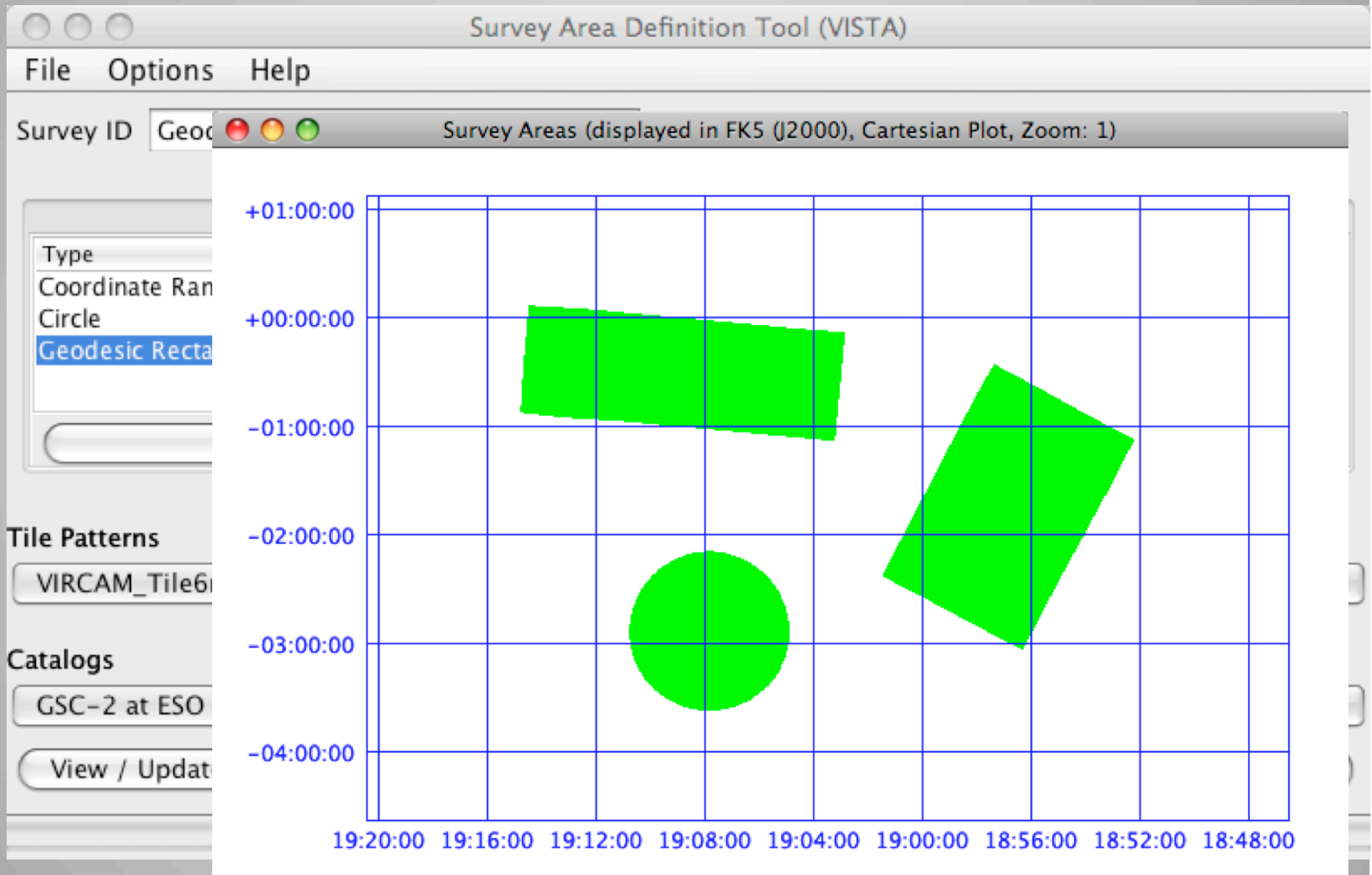
Given values input by the user for:

1. The boundaries of one or more survey areas each defined by some simple geometry in some coordinate system.
2. A value for TILE_OVERLAP_X the tile-to-tile overlaps in arcsec required in X.
3. A value for TILE_OVERLAP_Y the tile-to-tile overlaps in arcsec required in Y.

Or

as an alternative (e.g. for complex areas) to 1,2,3 SADT can read in an xml input file containing the centre positions of the required survey areas (in the xml SURVEY_AREA format) and operate on these areas. Individual tiles can be handled by defining an area as a geodetic rectangle and giving the rectangle the precise dimensions of one tile.

Entering a survey



Survey Areas & Tile Centres

Generation -2

Then given a value input by the user for:

- The name of the file containing a sequence of offsets for the pawprints to be used to make one tile. This is selected from the available Tile***.paf files (which, for a fixed number of pawprints, differ only in the order of pawprint execution).

The SADT will generate the coordinates and position angles of the tiles, and their component pawprints, which may be saved.

Optionally (and with further information input) it can also generate the guide and aO stars needed, but as this is time consuming this step should generally be done only when all the other parameters are set as the user wants.

The generated tile centre positions may be saved (and later re-imported) in an xml file.

Overlap and Maximum Jitter

Configuration preferences

Amount by which adjacent tiles should overlap (arcseconds):

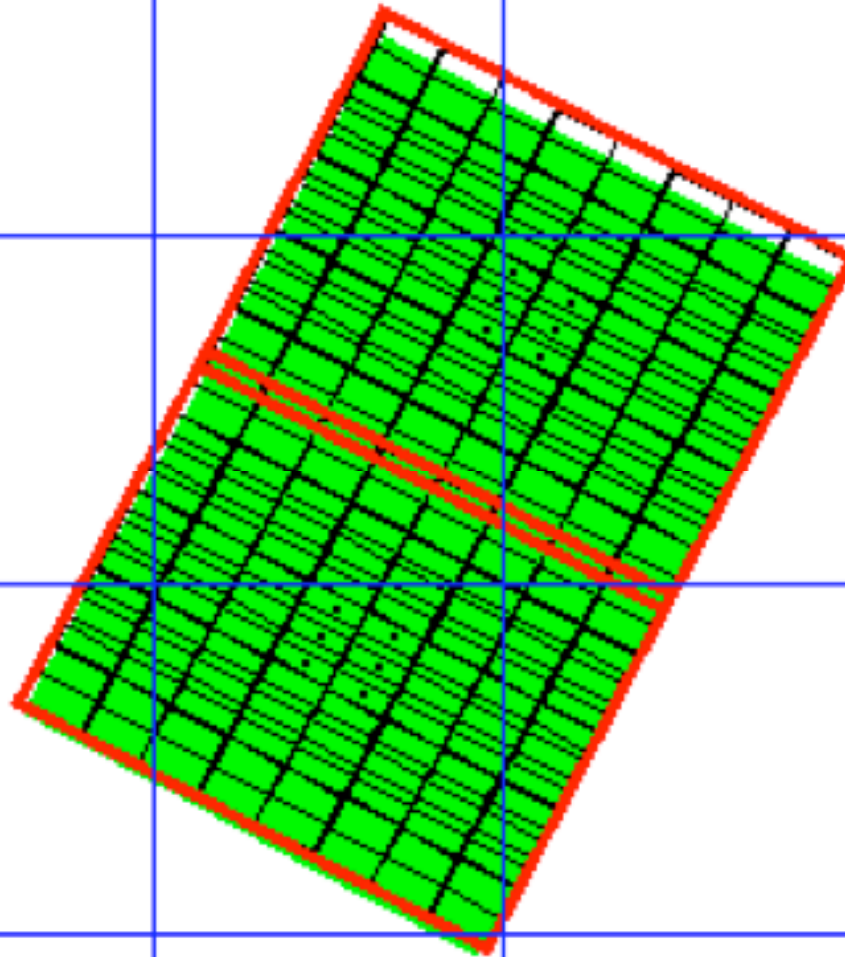
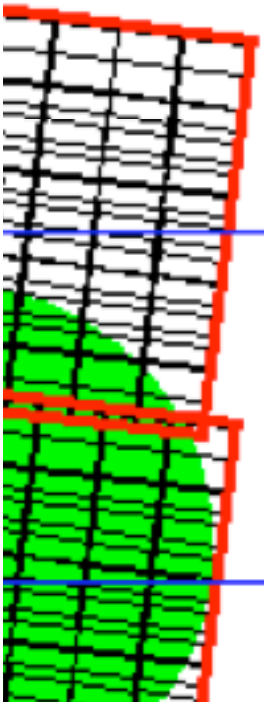
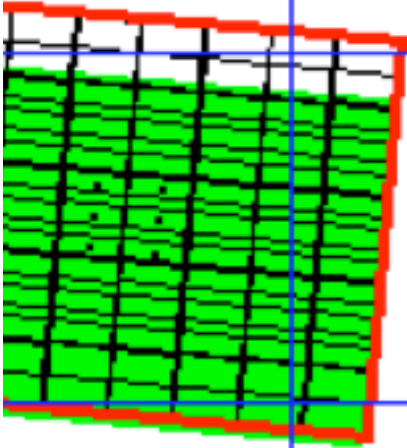
Horizontal Overlap: Vertical Overlap:

Maximum jitter which will be used in the survey (arcseconds):

Maximum Jitter:

Maximum Jitter amplitudes

Name JitterNumber PointsSymbol	Max peak-peak Jitter amplitude for SEQ.JITTER.SCALE =1.0 (arcsec)	Comments
Single	0	No jitter
Jitter2d	20	2 point jitter - top left to bottom right
Jitter2u	20	2 point jitter - bottom left to top right
Jitter3d	20	3 point jitter - top left to bottom right
Jitter3u	20	3 point jitter - bottom left to top right
Jitter4u	28	4 point jitter – rotated u shape
Jitter5m	18	5 point jitter – rotated m shape
Jitter5n	18	5 point jitter – rotated n shape
Jitter5z	28	5 point jitter – rotated z shape
Jitter9s	28	9 point jitter - rotated square shape
Jitter25s	28	25 point jitter - spiral pattern
Jitter30r1	20	3 jitters generated with random number generator



Xml file structure

<SURVEY> element

which contain one or more

< SURVEY_AREA > elements

which contain one or more

<TILE> elements

which each contain (typically 6)

<PAWPRINT> elements

which each contain one

<REFSTARS> element

giving coordinates and magnitudes of the guide and
aO stars which are converted into .paf files attached
to the OB

</ REFSTARS >

</ PAWPRINT >

</ TILE >

</ SURVEY_AREA>

</ SURVEY >

Example: RA-Dec range

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<SURVEY id="Geod-Rect_Circ_Coord-  
Rang" ip="Obsolete VIRCAM IP"  
maxJitter="30.0" tileOverlapX="60.0"  
tileOverlapY="390.0">
```

```
<SURVEY_AREA angle="-5.0"  
coordSys="FK5 (J2000)" exclude="false"  
lat1="-01:00:00" lat2="+00:00:00"  
long1="19:03:00" long2="19:14:40"  
number="1" type="Coordinate Range"/>
```

Examples: Ecliptic Circle & Galactic Rectangle

```
<SURVEY_AREA angle="0.0"  
coordSys="Ecliptic" exclude="false"  
lat="19.5" long="288.0"  
number="2" radius="1.47" type="Circle"/>
```

```
<SURVEY_AREA angle="35.0"  
coordSys="Galactic" exclude="false"  
height="2.2"  
lat="-2.0" long="32.0"  
number="3" type="Geodesic Rectangle"  
width="1.47"/>
```

```
</SURVEY>
```

Find Guide/AO Stars for Tiles

With the additional choice of

1. The total maximum amplitude in arcsec of any microstep and jitter patterns the user will use in his OBs
2. The guide/aO star catalogue selected from a list (and an internet connection to access the catalogue chosen).

The SADT will find all the Guide stars and active Optics (aO) stars needed for observing the pawprints for each tile.

If the tile positions were generated by SADT and it cannot find suitable guide/AO stars for pawprints it will attempt to move the tile centres until it does, without leaving any gaps in the survey.

N.B. This will modify the tile centres, and these modifications may depend on the guide /aO star catalogue used.

View and set Tile values

SADT also allows the user to:

- view the surveys / tiles / pawprints in several coordinate systems and projections
- iteratively adjust and replot the survey areas and tiles
- zoom
- graphically exclude or delete regions
- query the coordinates of a point

Export positional data to P2PP

- The survey areas, tiles, pawprints and guide/aO stars generated should be saved as a file in XML format (with extension *.xml*) for later import into P2PP to enable produce all the OBs (Observation Blocks) needed to implement the Survey.
- The XML files can also be imported into SADT using the *File / Open* menu for further work and adjustment.

Output File

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SADT peculiarities

- Plotting is not always accurate (currently being remedied)
- However the xml outputs are ALWAYS CORRECT
- So if you don't see quite the tile-tile overlap you expect don't worry – your xml output will be correct.

Caveats

- Xml files generated with the current version would need hand editing of the tile 'angle's to produce OBs that will find right AG/aO stars.
 - Need to flip sign of the tile rotator offset 'angle' and pus it in range -180 to +180
 - No change needed to survey area angles or pawprint angles.
- Plotting especially polar plots and rendering of pawprints / tiles is being improved.
- Next SADT version fixes 'angle' (and plot)

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