

FUN WITH FOURIER TRANSFORMS

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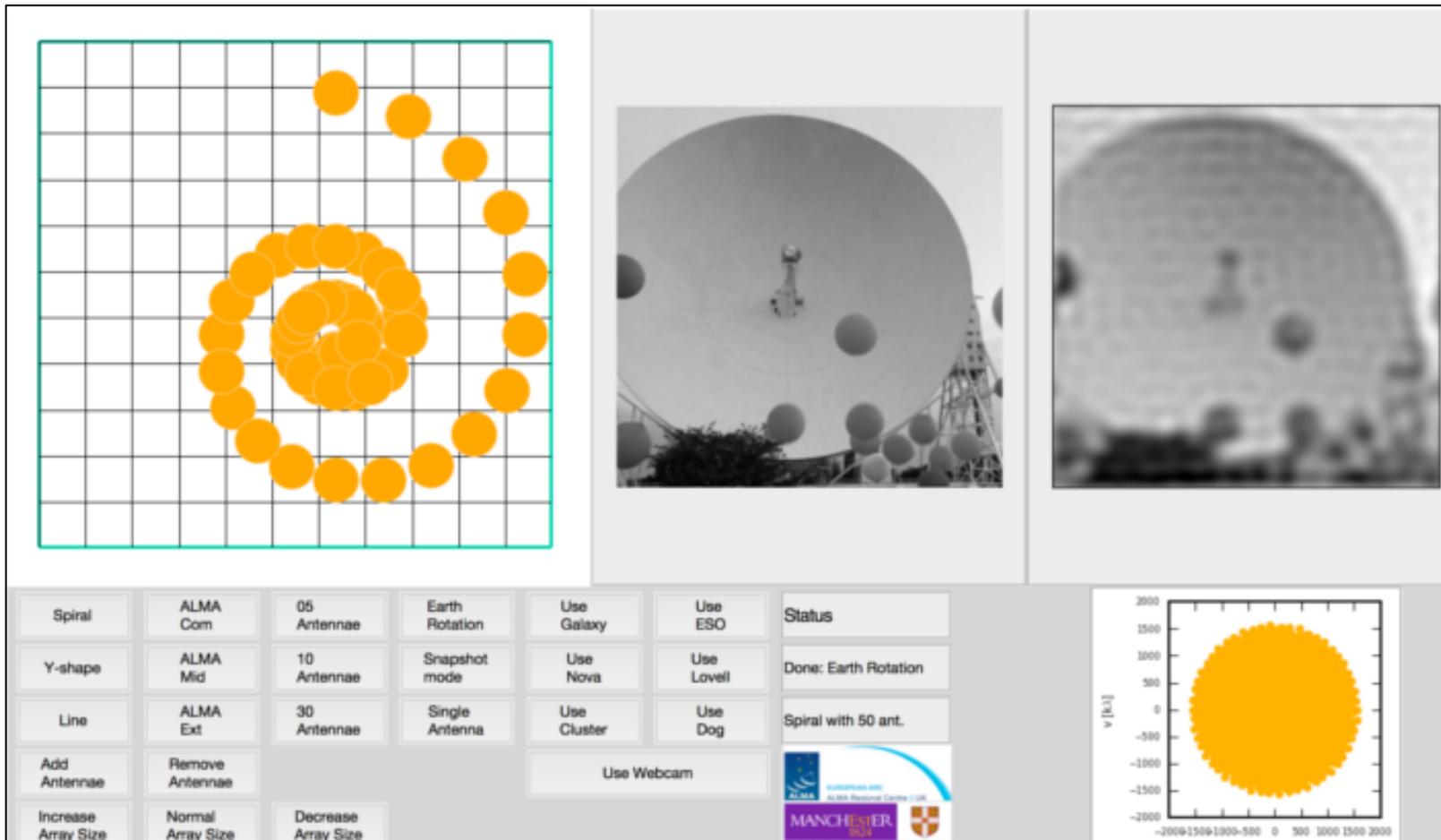
EUROPEAN ARC
ALMA Regional Centre || UK

Overview

- “Toy” interferometers to get your head round things
- Simulating ALMA observations

Pynterferometer

- <http://www.jb.man.ac.uk/pynterferometer/>



The screenshot displays the Pynterferometer web application interface. It features a grid-based antenna layout visualization, a photograph of a radio telescope dish, and a grayscale image of a celestial object. The interface includes a control panel with buttons for selecting antenna configurations (Spiral, Y-shape, Line), adding/removing antennas, and adjusting array size. It also shows the current status (Earth Rotation) and provides information about the ALMA National Centre for UK and the University of Manchester.

Spiral	ALMA Com	05 Antennae	Earth Rotation	Use Galaxy	Use ESO	Status
Y-shape	ALMA Mid	10 Antennae	Snapshot mode	Use Nova	Use Lovell	Done: Earth Rotation
Line	ALMA Ext	30 Antennae	Single Antenna	Use Cluster	Use Dog	Spiral with 50 ant.
Add Antennae	Remove Antennae			Use Webcam		
Increase Array Size	Normal Array Size	Decrease Array Size				

ALMA NATIONAL CENTRE FOR UK
UNIVERSITY OF MANCHESTER

MANCHESTER

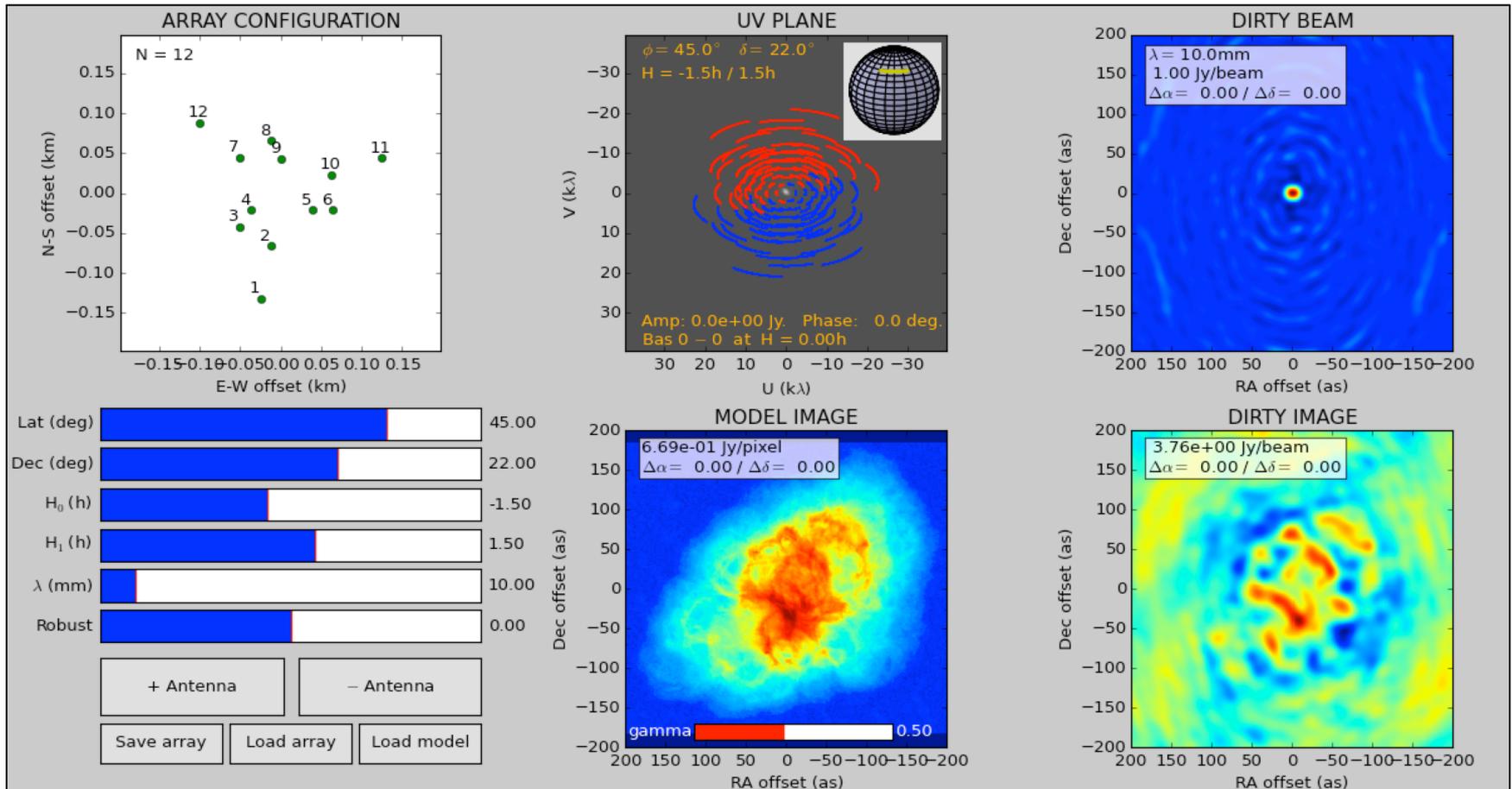
v [k]

-2000 1500 1000 500 0 500 1000 1500 2000

-2000 1500 1000 500 0 500 1000 1500 2000

APSYNSIM

- <http://www.nordic-alma.se/support/software-tools>



Overview

THE OST

- Introduction to the OST
- *Hands on with the OST*
 - *OST Inputs*
 - *OST Output*

CASA

- simobserve
- simanalyse
- Simalma

The Observation Support Tool

ALMA Observation Support Tool
Version 3.0

OST NEWS HELP QUEUE LIBRARY ALMA HELPDESK

OST Report: OST usage statistics during the ALMA Cycle 3 Call.

Array Setup:

Instrument: ALMA Select the desired ALMA antenna configuration.

Sky Setup:

Source model: OST Library: Central point source Choose a library source model or supply your own.

Upload: Browse... No file selected. You may upload your own model here (max 10MB).

Declination: -35d00m00.0s Ensure correct formatting of this string (+/-00d00m00.0s).

Image peak / point flux in mJy 0.0 Rescale the image data with respect to new peak value. Set to 0.0 for no rescaling of source model.

Observation Setup:

Observing mode: Spectral Continuum Spectral or continuum observations?

Central frequency in GHz: 260.7 The value entered must be within an ALMA band.

Bandwidth in GHz 4.125 OK Select the total bandwidth for continuum observations. Enter 7.5 GHz to select ALMA recommend full continuum setup.

SPW 0: 254.0 BW 0: 1.875 Set the central frequency and bandwidth of each baseband/SPW in GHz. SPWs can only be placed within the grey shaded areas. They will be truncated in the simulation if not.

SPW 1: 252.0 BW 1: 1.5 More SPWs (up to SPW3) will become available as you increase the total bandwidth.

SPW 2: 267.0 BW 2: 0.75

SPW 3: 0.0 BW 3: 0.0

Band = 6

211 260.7 275

The ALMA Observation Support Tool (OST) is a web-based ALMA simulator aimed at the non-interferometry expert user.

Available since ALMA Cycle 0 CfP.

Has been extensively used by the international community ALMA Cycle 0, 1, 2 and 3 call for proposals.

Created in 2011 by Ian Heywood and since updated and developed by Adam Avison

See <http://almaost.jb.man.ac.uk>

(except for today... Go to http://almaost.jb.man.ac.uk/REAL_index.html)

USER @ HOME/OFFICE
Browser + e-mail Client

INPUT WEBFORM,
UPLOAD .fits etc...

USER'S EMAIL

OUTPUT WEBPAGE

OST @ MANCHESTER
Python/CASA backend

SUBMISSION NOTIFICATION

SERVER SIDE CHECKS

SIMULATION

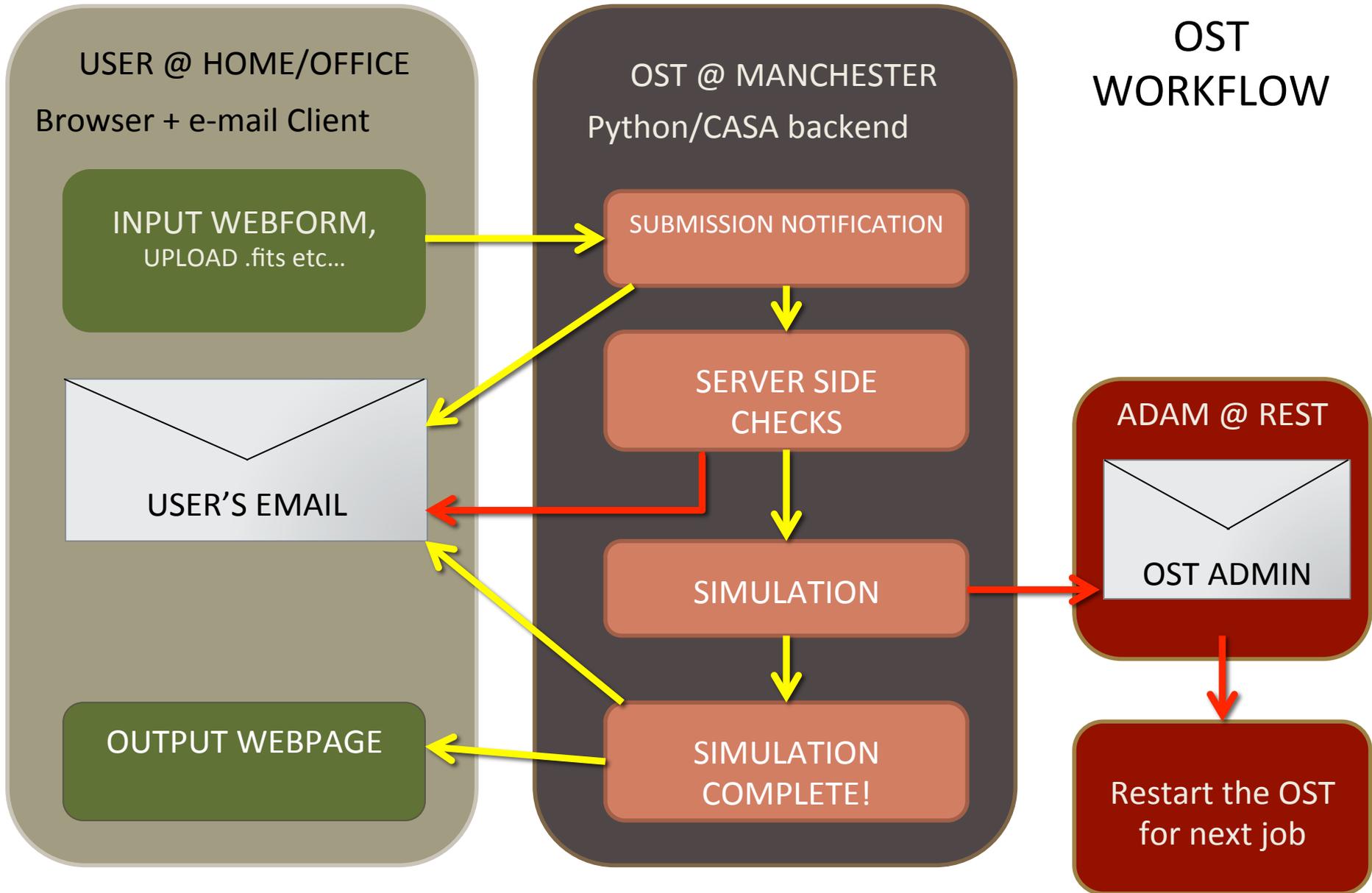
SIMULATION COMPLETE!

OST WORKFLOW

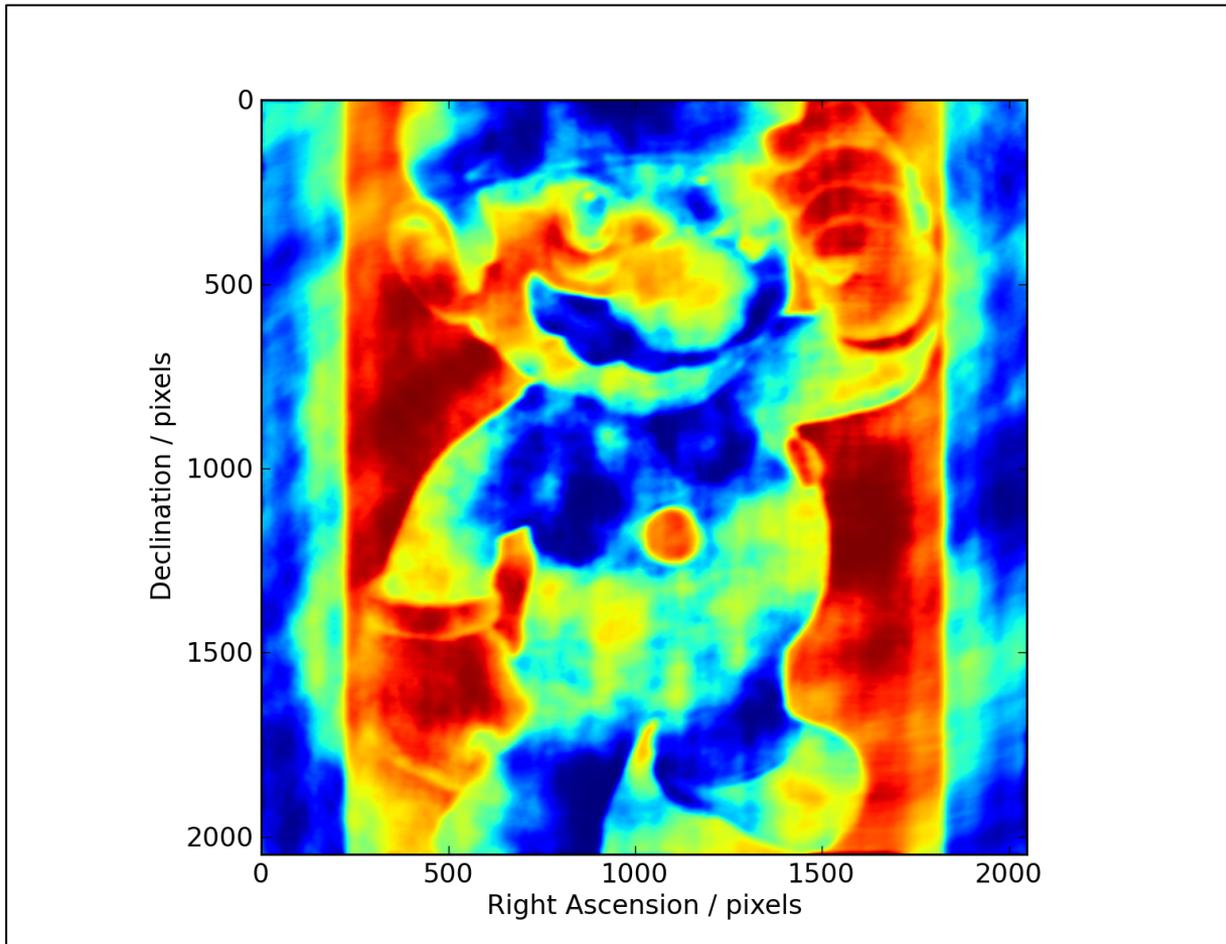
ADAM @ REST

OST ADMIN

Restart the OST
for next job



OST Walkthrough



- OST Simulation of the 'Super' M-4R10 Galaxy

Simulating with CASA

Simanalyze

Here we convert the CASA MS into an image file.

- The **image** parameter effectively acts like CLEANing a real dataset with iteration, weighting etc
- Next the **analyze** parameter defines which output images you would like from your analysis. Such as Clean image, UV coverage and image

```
# sim_analyze :: image and analyze simulated datasets
project          = 'sim'          # root prefix for output file names
image            = True          # (re)image $project.ms to $project.image
  vis            = 'default'     # Measurement Set(s) to image
  modelimage     = ''           # prior image to use in clean e.g. existing
                                # single dish image
  imsize        = 0             # output image size in pixels (x,y) or 0 to match
                                # model
  imdirection   = ''           # set output image direction, (otherwise center
                                # on the model)
  cell          = ''           # cell size with units or "" to equal model
  niter         = 500          # maximum number of iterations (0 for dirty
                                # image)
  threshold     = '0.1mJy'     # flux level (+units) to stop cleaning
  weighting     = 'natural'     # weighting to apply to visibilities
  mask          = []           # Cleanbox(es), mask image(s), region(s), or a
                                # level
  outertaper    = []           # uv-taper on outer baselines in uv-plane
  stokes        = 'I'          # Stokes params to image

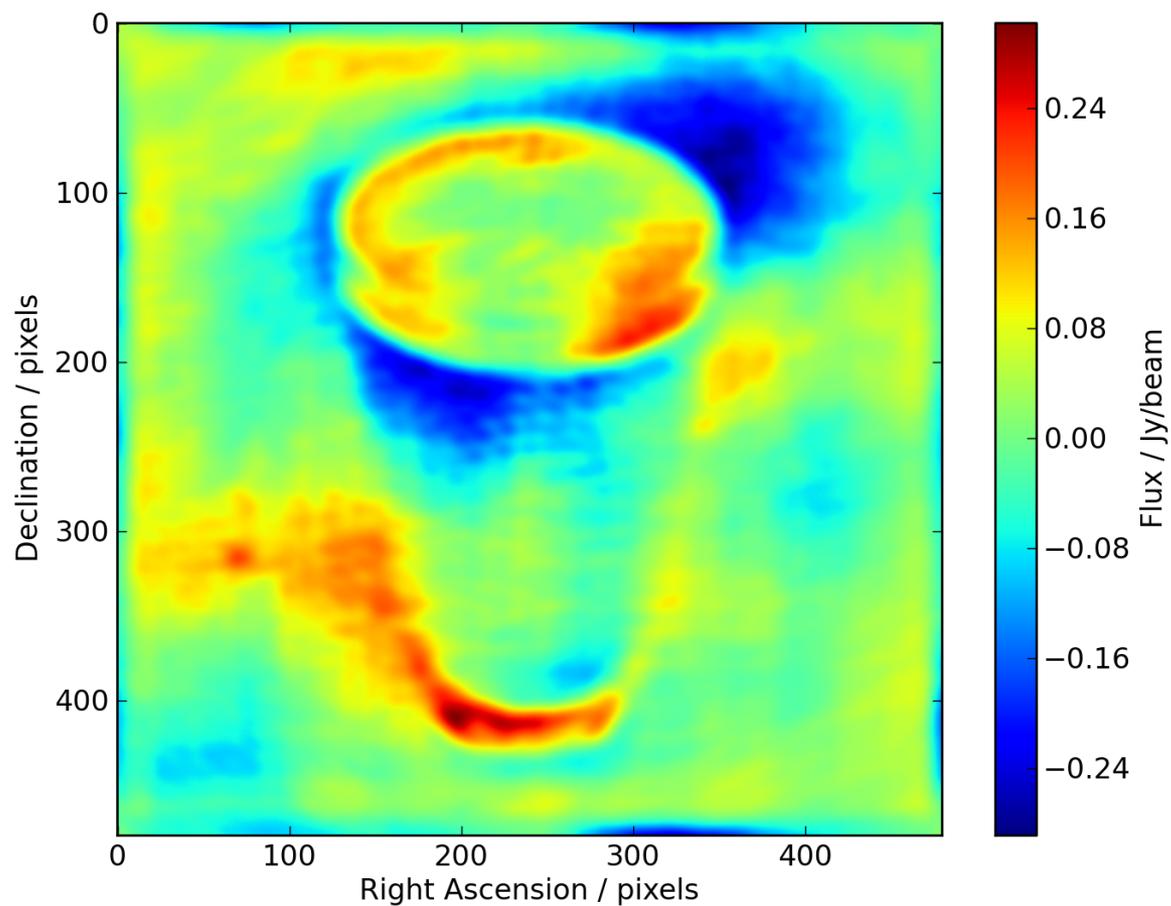
analyze          = True         # (only first 6 selected outputs will be
                                # displayed)
  showuv        = True         # display uv coverage
  showpsf      = True         # display synthesized (dirty) beam (ignored in
                                # single dish simulation)
  showmodel     = True         # display sky model at original resolution
  showconvolved = False       # display sky model convolved with output beam
  showclean     = True         # display the synthesized image
  showresidual  = False       # display the clean residual image (ignored in
                                # single dish simulation)
  showdifference = True       # display difference image
  showfidelity  = True         # display fidelity

graphics        = 'both'      # display graphics at each stage to
                                # [screen|file|both|none]
verbose         = False       #
overwrite       = True        # overwrite files starting with $project
async           = False       # If true the taskname must be started using
                                # sim_analyze(...)
```

Simalma

- A wrapper of simobserve and simanalyze which has some of these tasks parameters set to typical ALMA values.

Back to OST output



Daily usage Cyc3 v 2,1,0

