

INTERFEROMETRY and ALMA BASICS

Give a short definition of:

- interferometer
- visibility (main properties, point like and extended sources)
- aperture synthesis
- baseline
- angular resolution
- field of view
- sensitivity
- maximum recoverable scale

Concerning ALMA, provide:

- number of antennas, arrays bands, polarization, and bandwidth
- baseline max, min and MRS, angular and spectral resolution
- search in the website the more extended and compact configurations
- use the sensitivity calculator to estimate the sensitivity to detect one of your source
- use the ALMA science archive to search and download data for one of your target

Optional

For Pictor A:

- search ALMA archive data
- using NED literature and ALMA archival information, estimate the MRS, size, sensitivity to detect the core in all bands

APSYNSIM UV simulator

Ivan's code is available in: <https://launchpad.net/apsynsim/trunk/1.2b>.
More source and array models here <http://www.ira.inaf.it/~liuzzo/UniTO/>
To launch it , e.g.: `cd APSYNSIM_v1.2b_POSIX/SCRIPT/ casapy -c APSYNSIM.py`

Hands-on

1) Model = Point_center; Array = 2 antennas

- set snapshot observation
- add antennas (up to 6)
- change the observing time (H: -5 to 5)
- change the wavelength

Notice the differences, e.g. In dirty beam

2) Model = 2_points; Array: the 6 antennas just created

- moving antennas to short distances ~ 300 m: the 2 sources are unresolved
- with $bl > 600$ m the two sources are resolved

How the detection of sources changes?

3) Model 2Points and gaussian; Array: the same as before

- start with the extended array
- move the antennas closer to recover the extended emission
- alma 3.6 configuration
- a more compact alma configuration (ACA + alma cycle 1)

When the extended emission starts to be recovered?

In which configuration and what sources are filtered out and resolved?

4) Model: Face-on-galaxy; Array: ALMA cycle 3.6

- diffuse emission filtered out completely
- the more compact cycle 3.4
- ACA + alma cycle 3.4

How is the diffuse emission in the ALMA cycle 3.6? and in the other configurations?

5) optional

Model: Radio galaxy ; Array: VLA

- different VLA configurations as before
- change the wavelength and observe with alma different configurations

Notice the differences.