ELEC-E4530 - RADIOASTRONOMY 2019

Practice session: exercises in VLBI
INSTRUCTIONS
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17^{th} of October 2019

In the next practice session, we will be using radio interferometer simulators. I recommend you to install the simulators (see below), Python (2.7.x) and Python (3.x.x) in your personal computer. Make sure you have also installed the packages: matplotlib, numpy and scipy. Install all the programs before to attend the practice session, so we will directly start with the exercises. These will be provided on the same day.
If you find problems setting up the programs in your local computer, please send me an e-mail or come to my office desk for help. You can find me at the Metsähovi office (2173), ELEC department.

1 Pynterferometer simulator

Pynterferemoter is a python based simulator developed for general public outreach. It is designed to demonstrate the techniques of radio interferometry in a very interactive and easy manner. This tool will help you to visualize how a different number of antennas, array configurations and Earth's rotation allow to create high resolution images at long wavelengths. This exercise is designed for remind you the main concepts of interferometry explained during the lectures.

First download the program from the following link:

http://www.jb.man.ac.uk/pynterferometer/index.html

The program runs on Windows (v1.0 only), Mac OSX and Linux. To run the simulator go to the folder "V2_Eris", open a terminal and then type:

> python Pyntv2ERIS.py

2 Aperture Synthesis Simulator for Radio Astronomy

In this exercise you will experiment with a more advanced interferometer simulator called APSYNSIM (APerture SYNthesis SIMulator). This tool includes several options as changing source coordinates, observing wavelength, antenna location, integration time, as well as deconvolution of the interferometric data (amplitude and phases). Download the preferred program distribution for your system from

https://launchpad.net/apsynsim/+download.

You do not need to install the program but to run it as instructed in the README file. Read also the instructions given in INSTRUCTIONS_EXERCISES.pdf, so this will help you to understand how to use the simulator. Additionally, review the lecture slides about deconvolution process with the CLEAN algorithm to obtain interferometric images.
Note: If you use linux, download the last version: APSYNSIM_1.4b4