

Data Processing School :: Exercise 51

Source directory	/data/lofarschool/data/exercise 51
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Context

This exercise demonstrates a PyDAL script that produces plots of the “total power”, or autocorrelation, for each antenna. This kind of plot is commonly used as a quick check of the quality of the data.

Prerequisite

A little knowledge of shell and python programming (or at least a curiosity to learn).

Description

You will run a script that uses the PyDAL to read in a Measurement Set and plot some of the data. This script plots the total power or one or more antennas.

Files & Directories

You will find the following in the exercise directory:

1. L4086_sSB10.MS - Uncalibrated CS1 Measurement Set taken with the LBA over roughly 80 hours.
2. run_script.sh - bash script to run the python script
3. total_power_all.py - python script that uses the PyDAL
4. vvL4086_sSB10.MS_0tp.png - an image of the plot output by “total_power_all.py”.

Step-by-step instructions

1) Run “run_script.sh” and answer the following questions:

- a) The plot should show a rising and falling pattern for each antenna's total power. What causes this pattern? How often does it repeat (to minute precision)?
- b) Do you expect the different antennas to have different patterns? Why?
- c) Cas A and Cyg A are located near the Galactic plane. Use that to estimate “galactic day” and “galactic night”. If you want to observe the EoR, when will you observe?
- d) Why does the shape of the total power curve look different between the xx and yy curves?

Example outputs

See the png file for an example of what “total_power_all.py” produces when run from the csh script.

Outstanding problems

Corrected - ER

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