cherenkov telescope array

INFN PADOVA
Istituto Nazionale di Fisica Nucleare
Sezione di Padova

LST Data analysis - intro

Rubén López-Coto, INFN Padova

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Welcome

- Welcome everybody!

- Instructions and material for the workshop:
  - https://github.com/rlopezcoto/intro-iact-analysis
  - git clone https://github.com/rlopezcoto/intro-iact-analysis.git

- Schedule:
  - **Monday:** Software setup + we start in the afternoon with the lessons.
  - **Tuesday, Wednesday, Thursday and Friday** we will have lessons in the morning.
    - Afternoon sessions are *free exercise*, meaning that we will not have any lesson and you can use them to perform the exercises that will be left.

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Timetable

	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 - 10:00	Setup	astropy	LST analysis - intro	Standard MC processing	Special analyses: Src dependent
10:00 - 11:00	Setup	CTA software and dependencies	lstchain - LST Data	Standard MC processing	Special analyses: Src dependent
11:00 - 12:00	LST Analysis call	ctapipe - Presentation	LST calibration	Real data analysis	Other analyses
12:00 - 13:00	LST Analysis call	ctapipe - notebooks	LST calibration	Real data analysis	Git Contributions
13:00 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch
14:00 - 15:00	Lunch	Exercises	Exercises	Exercises	Exercises
15:00 - 16:00	Scientific Python	Exercises	Exercises	Exercises	Exercises
16:00 - 17:00	Scientific Python	Exercises	Exercises	Exercises	Exercises

- Exercises slots are “free” for you to work on the exercises that will be put in the lessons

Dynamic

- Short lessons with slides + hands on
- ipython notebooks for demonstrations
  - Scientific python overview Monday, no need of CTA specific software.
  - astropy and ctapipe Tuesday, no need of LST Data access.
  - LST Data analysis demonstrations using notebooks for Wednesday/Thursday
- Hands-on data analysis at the IT cluster
  - LST Data analysis at the IT cluster Thursday/Friday
- **It is very important to have an LDAP account to access the IT cluster and download LST data as soon as possible, it may take a few days until you get one.**

First lesson

- Every second Monday, we hold the LST Analysis and Software calls from 11:00 - 13:00 CET
  - https://indico.cta-observatory.org/category/149/
  - Please join the calls!

- To keep you informed about the new developments from the group, please join the lst-reco mailing list:
  - https://portal.cta-observatory.org/_layouts/people.aspx?MembershipGroupId=3041

- Let us join the call today.

Now: Requirements and setup

- We will have (are having) a setup session from 09:00 - 11:00
  - If everything is working for you, then you can skip this session.
- Instructions and material for the workshop:
  - https://github.com/rlopezcoto/intro-iact-analysis
- Further instructions
  - https://github.com/rlopezcoto/intro-iact-analysis/blob/main/requirements.md

Credits

- These lessons are mainly extracted material already prepared
- Slides taken from:
  - Software schools
  - CTA general meetings
  - ASWG calls/meetings
  - LST analysis calls/meetings
- Notebooks taken from:
  - Software shoots
  - ctapipe notebooks
  - cta-lstchain notebooks
- More info in the README files of each folder.

Now: Software setup

- Problems?

Now: Software setup

- Do you have anaconda installed on your machine?

1. Install software

Please come with your computer and software already installed. If you have problems, do not hesitate to write before the start of the lessons. In any case, we will have a setup session the first day to solve problems with the installations.

We recommend you install Anaconda from https://www.anaconda.com/

To check that your installation and setup is OK, try to exectue the following Python code:

- `print('hello world!')`
- `import numpy`
- `import scipy`
- `import matplotlib`
- `import astropy`

If you get an `ImportError` you don't have all the software we will use.

Try to execute `print('hello world')` from three places:

1. Python terminal (type `python` to start)
2. IPython terminal (type `ipython` to start)
3. IPython notebook (= Jupyter notebook) (type `jupyter-notebook` to start)

You can find instructions how to do the installation and how to start Python and IPython and execute your first Python code here:

- Section 1 ("Introduction", install section at the bottom) and 2 ("How to run Python code") from "A Whirlwind Tour of Python"
- More information for IPython (how to start and execute notebooks) is available in Chapter 1 of the "Python Data Science Handbook"~
- Basic knowledge of python is necessary for the start of the course, here there are a good list of notebooks and the Python Data Science Handbook:

Now: Software setup

- Do you have anaconda installed on your machine?
- Do you have the CTA-specific software installed?

2. Install CTA-specific software

For the purposes of the lessons, we will need ctapipe, cta-lstchain, gammapy and all the auxiliary software coming with them.

You can create a conda environment and install all the needed LST-specific software and its dependencies by following the instrunctions of cta-lstchain installation

Now: Software setup

- Do you have anaconda installed on your machine?
- Do you have the CTA-specific software installed?
- Do you have an LDAP account to access the IT cluster? Can you access LST data?

3. Access to the La Palma IT Cluster and LST Data

There is an IT cluster in LP that allows to access data and run analysis on site, it is powerful and can be used for LST and CTA members. It is wise to have access to data there. Obtain an LDAP account Send a request to Daniela Hadasch (hadasch@icrr.u-tokyo.ac.jp) to be included in the "ctan-onsite-it" group and the `lst` group (to access LST data at PIC).

Afterwards you will receive an e-mail from Microsoft Online Services Team. Follow the instructions in the e-mail. Once you logged in with the temporary password, you have to set your own password.

Your LDAP account looks like this:

user name: firstname.lastname

password:

with an associated e-mail address firstname.lastname@cta-observatory.org.

Data to download

- In the IT cluster, all the necessary data can be found in:
  - /fefs/aswg/workspace/ruben.lopez/2021_02_rijeka_school/data/data.tar.gz
- Uncompress it and put the folder in the:
  - intro-iact-analysis/notebooks