Poll for the GRAND hands-on session (DunHuang, April 27)

Dear participant,

we propose to organise the hands-on session around several distinct micro-workshops (probably six), each with specific goals and different level of complexity. Each micro-workshop session will last for ~1h30 roughly and will run in parallel to the others. You would therefore be able to participate in up to four micro-workshops during the day.

Below we propose a list of topics. **Please choose, according to your level in programming ("target audience") & personal interest, up to six micro-workshops you would like to participate in.** This will allow us define the final format and content of the session. This obviously means that we cannot guarantee that all choices you make will eventually be available.

Please send your selection before April 10 to omartino@in2p3.fr, by order of preference under the form "G, B, A, D, H". Please, specify in your email your coding level in C and/or Python (beginner/intermediate/advanced) or any other remark you will consider appropriate.

This poll is open to all: those of you who have pre-registered for the hands-on on session on the workshop website will have priority, but others may join if logistics permit.

Finally note that to actually perform the tutorials proposed in the hands-on session, you will need a laptop with a Linux system running on it (either Native Linuxe, Linux inside MacOS, Windows with Linux Virtual Machine, etc).

Thanks for your reply!
GRAND soft team

Micro-workshop topics:

A- Tools for software development [responsable: V. Niess]
In this micro-workshop we will introduce some common tools for software development, used in GRAND. Namely, git (with hooks) and GitHub (with Travis CI and Codecov services).
Target audience: everybody. Prior knowledge of at least one programming language is a plus.
Note that this micro-workshop will be open only during the first time slot (9-10h30)

B- Python-I [responsable: JP Lenain, V. Decoene & O. Martineau]
In this micro-workshop, we will guide you in your first steps with Python, using basic tutorials.
Target audience: beginners & intermediate levels in Python
Langage: Python

C- Python-II [responsable: JP Lenain, V. Decoene & O. Martineau]
This micro-workshop is a natural continuation of the previous one. Here we will focus on more advanced topics (closer to GRAND), using tutorials from astropy and gammapy.
Target audience: beginners & intermediate levels in Python
Langage: Python

D- ZHaireS simulation [responsable: Matias Tueros]
This micro-workshop aims at teaching you how to install and run the ZHAireS simulation code for radio emission by air showers, the standard tool used in GRAND. We will help you to install the ZHaireS software, explain its basic principles and how to configure a simulation. You will be able to run a simulation (only on a limited number of antennas, given the lack of time) and retrieve the results.
Target audience: beginners
Langage: bash

E- Radio Morphing (simulation) [responsable: Anne Zilles]
This micro-workshop aims at giving a short introduction into the method called Radio Morphing (see https://arxiv.org/abs/1811.01750) which can be used to calculated the expected radio signal from (at the moment) tau-decay induced showers (limited to typical GRAND events so far). We will help you to install Radio Morphing, run it on an example shower and point you to the most important 'features' you should have in mind if you want to use it.
Target audience: beginner in Python. Probably easier if you have a minimal background on the physics of radio emission by air showers.
Langage: Python

F- Radio signals in GRAND [responsable: Anne Zilles, Valentin Decoene & Olivier Martineau]
This micro-workshop will introduce you to basic tools to display and manipulate simulated timetraces of radio signals. In particular we will apply filtering in different bandwidth, adding noise and performing numerical sampling. We will also display the amplitude and polarization patterns on ground to help you understand how shower characteristics (zenith angle or energy), ground topography or treatment (filtering) affects the signal measured.
Target audience: intermediate in Python
Langage: Python

G- Shower direction reconstruction in GRAND [responsable: Valentin Decoene]
In this micro-workshop we will introduce you to the code performing the reconstruction of the shower direction of origin, using simulated shower.
Target people: intermediate/advanced in Python
Langage: Python/C

H: Geant4 [responsable: Anne Zilles]

Geant4 is a tool for simulation of interaction and tracking of particles in dense media. It is often used to simulated particle detectors in (astro)particle physics. If you have never heard about it before, but you plan to step into the simulation of the particle detectors for GP300, we give you here a quick introduction to the tool, help you setting up the software and run a quick simple example provided by Geant4.

Target audience: intermediate/advanced in C

Langage: C

I: Topography and coordinates systems in GRAND [responsable: V. Niess]

This micro-workshop aims at introducing the tools used in the GRAND software to manipulate topography information and coordinates systems, a key feature in GRAND software. The low level routines are based on a dedicated C library: TURTLE. The GRAND software provides a higher level application programing interface (API) in Python, interfaced to astropy. Both (C & Python) API can be introduced.

Target audience: intermediate knowledge in at least one of the programming languages

Langage: C or Python

J: Neutrino simulation in GRAND [responsable: V. Niess]

This micro-workshop aims at introducing you to the DANTON C library, dedicated to the coupled ν_τ-τ transport. The library exposes a C API for integration in a higher level simulation scheme. An executable is also provided, steerable from JSON cards. A specific wrapper was developed for GRAND: RETRO.

Target audience: intermediate knowledge in C for the library API

Langage: C