GRAND hands-on @ DunHuang workshop (April 27, 2019): Presentation of the micro-sessions

The hands-on session is organized around 4 different topics, each composing a "micro-session" expected to last 1h30.

Related materials are (or will be soon ;-p) stored in a [dedicated GitHub repository](#).

1- Introduction to (GRAND) Python

Setup a proper work environment and 1st steps with Python3. For experts, be a beta tester: experiment the GRAND software and submit issues when you find bugs.

2- Simulation of radio emission by air-showers for GRAND

a. ZHAireS : introduction to Aires and its radio extension ZHAireS. Install the program, run your first simulation and plot the result.
b. Radio Morphing: brief overview and discussion on the code. Then produce a radio signal distribution of an air shower with radio-morphing.

3- GRAND scripts: playing with the generated signals

a. Radio signal processing: perform a detailed computation of the antenna response to an simulated electromagnetic transient signal and/or get accounted with these antenna signals((e.g. how the filtering frequency band may affect time traces, plot amplitude patterns at ground).
b. Angular reconstruction: reconstruct the direction of origin of the radio wave with two hypothesis: plane and hyperbolic wave front. Play with the reconstruction parameters.

4- C tools for the GRAND simulation and their interface

a. Handling topography data with TURTLE: brief introduction to the code; Experiment with its interface or the grand-tour wrapper.
b. Play with neutrino simulations: DANTON. Discover basics of the backward $\nu-\tau$ coupled transport. Experiment with the C or json APIs.