

1 Introduction & Motivation

The ongoing work of GBAR necessitates various scripts that access data from different aspects of the experiment. Such as data provided by the centralised logging system of the CERN accelerators (AD and ELENA) as well as our own data stored on the EOS system. The CERN logging system is called **NXCALS** and is made available in different interfaces. The most user friendly is the **SWAN Notebook**. The next sections explain how to get access to the NXCALS data and work with the existing scripts.

To simplify the ongoing work we want to share our working scripts on the existing **git repository** of GBAR. Please develop your own scripts in your own development branch, i.e. dev-phil in my case. Once you have a running script you would like to share, you can merge it with the master branch. This way everybody has access to the latest scripts and together we can optimise our work flow.

Please provide me and our collaborator with inputs if anything is unclear or needs to be updated. Good luck with the \bar{H} search!

2 How to get access to AD/ELENA Data

To work with the NXCALS logging system, one has to request access first. In case nothing has changed you can follow the steps provided below, else quickly check the **official documentation**.

1. Get authorization to NXCALS services. Request access using **CCDE form**
2. Select the accelerator you want to access the data from (ELENA or ADE)
3. You must also be registered on the **IT's Hadoop Team** e-group
4. It may take a few hours before you have access to the NXCALS clusters.

Once you have access to the NXCALS data you can check the logging system on **Timber**. After selecting the *Hierarchies* tab, you can go through the different accelerators (for GBAR you are typically interested in *ELENA*).

3 How to get access to EOS data

Accessing the GBAR data stored on the EOS system requires you to subscribe to the GBAR related **e-groups**. In the search field choose *e-group name contains gbar*. You can self subscribe to following e-groups:

1. Name: *eos-experiment-gbar-readers*, Description: GBAR experiment storage readers

4 Get the latest scripts from the git repository

Once you have access to EOS you can log onto the LXPLUS server and get the latest version of the git repository.

```
ssh username@lxplus.cern.ch
cd /eos/user/u/username
mkdir GBAR
git clone https://gitlab.cern.ch/GBar/data-analysis-software
```

You should now have a directory called *data-analysis-software*. This directory contains the latest scripts of the collaboration. Make your own development branch before you work on the files. Please update your files routinely on your branch as a backup.

```
git checkout -b dev-user
git add new_file.py
git commit -m 'This is how you should push your code onto gitlab.'
git push origin/dev-user dev-user
```

Once you have a code you want to share with everyone else push it on the master branch.

```
git checkout master
git merge dev-user
git checkout dev-user
```

In any case there are lots of tutorials online on how to work with git.

5 How to work with the SWAN Notebook

Open **SWAN** and choose the following settings:

Software stack: 100 NXCALS PRO

Platform: CentOS7 (gcc9)

Environment script: /eos/user/u/username *replace with your own path, i.e. p/pblumer

Number of cores: 4

Memory: 16GB

Spark cluster: BE NXCALS (NXCals)

If these settings are not available you might not yet be subscribed to the correct e-groups or have access to the NXCALS data cluster.

Once you have access to SWAN select *CERNBox* and go to your git directory. Open one of the files and choose *CELL* → *Run All*. Follow the steps of the individual cells.

The provided scripts show a basic analysis of the experiment up to the switchyard. If you want to create your own scripts or adapt these, work on your own git branch and upload them whenever they are ready to the master branch.