DAC21 highlights
&
What we learned!

Maisam M. Dadkan

RUG-FAIR/GSI collaboration for ESCAPE

WP2 3rd Workshop, 22 March 2022

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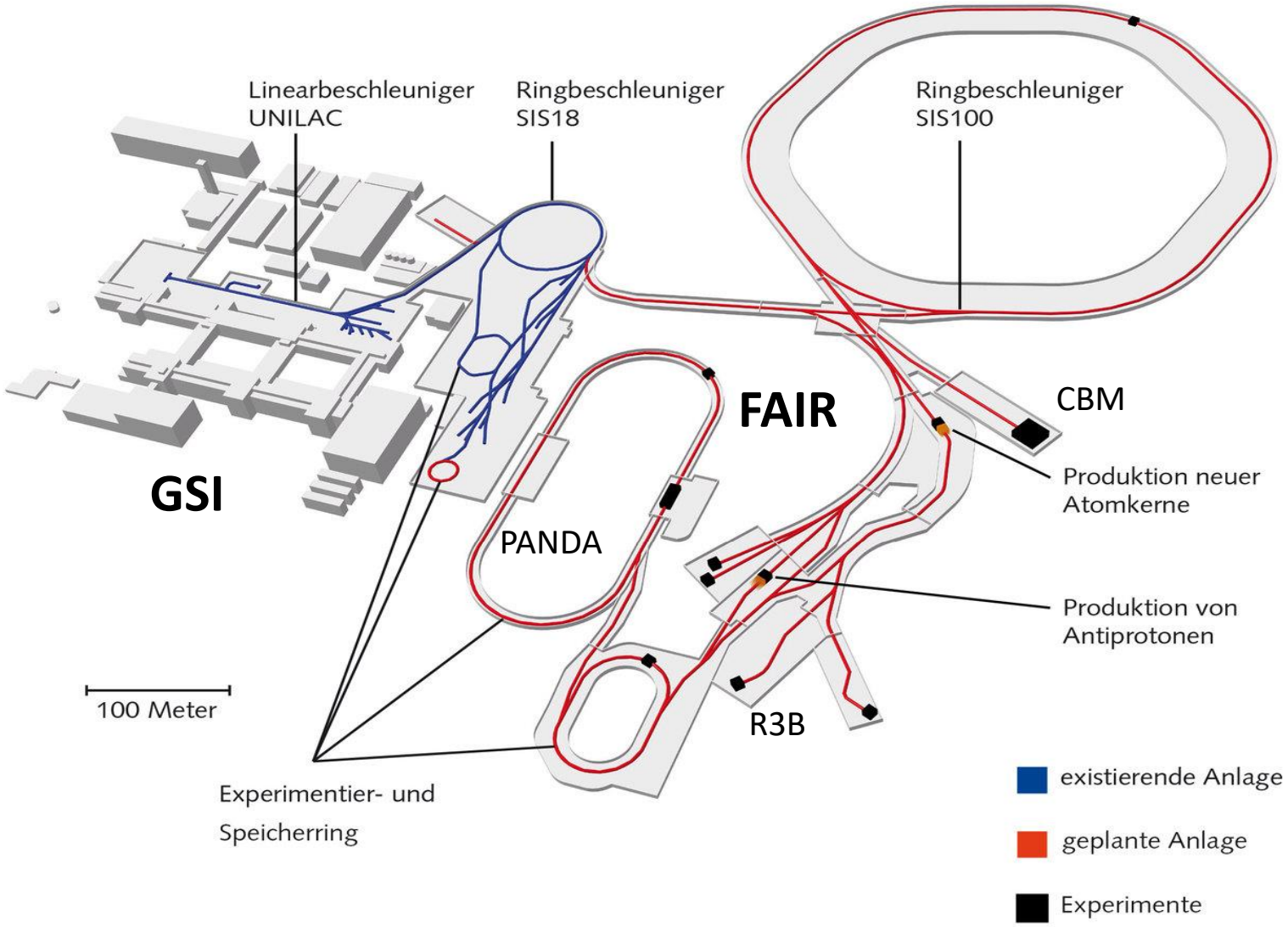
DAC21 highlights



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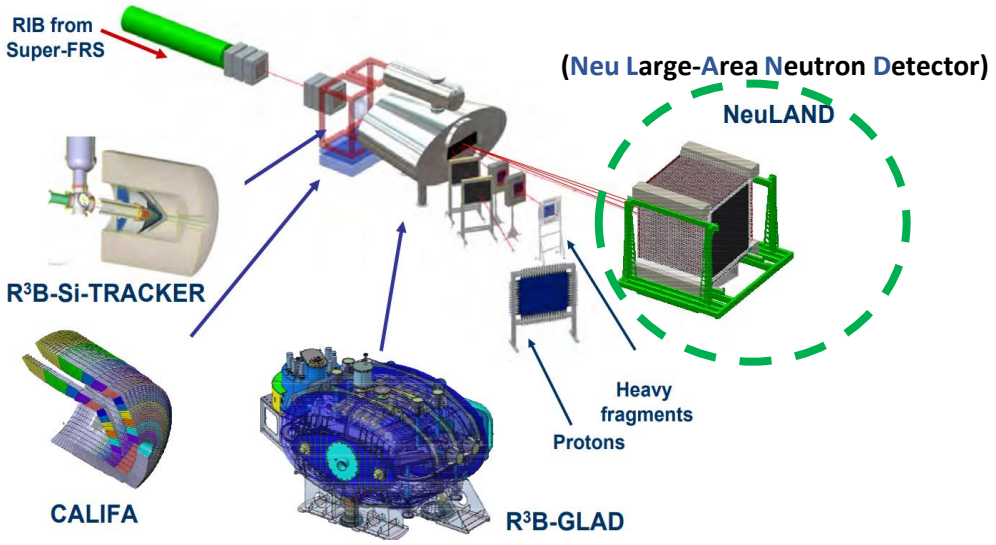
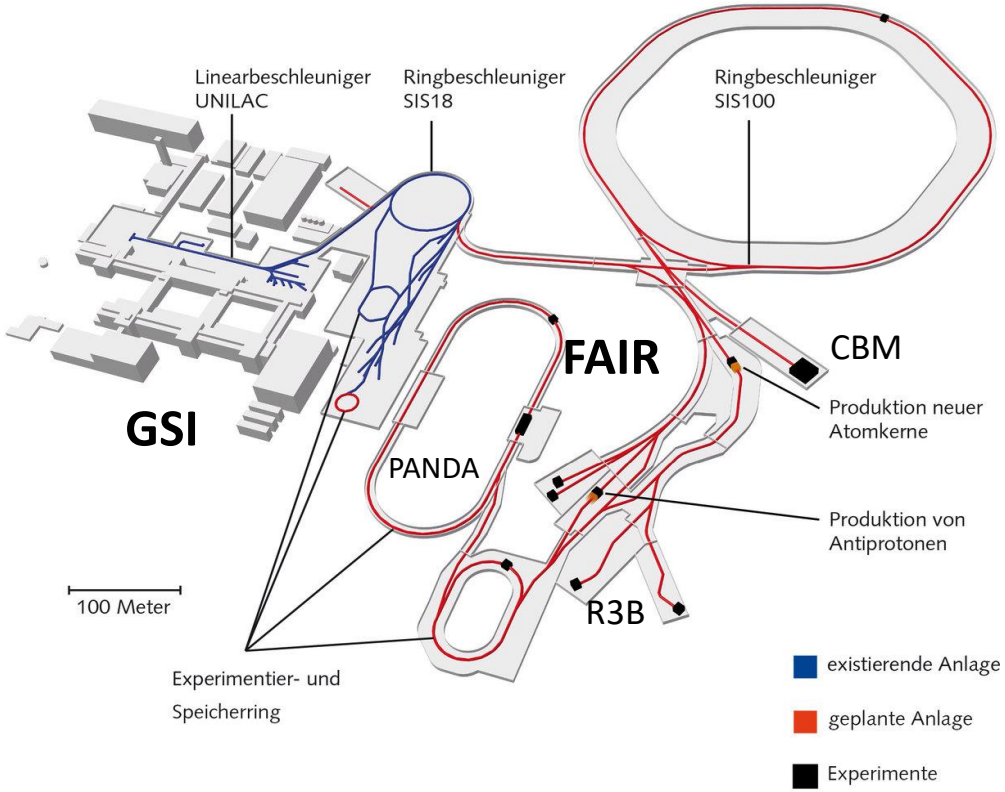
DAC21 highlights

R³B

Reactions with Relativistic Radioactive Beams





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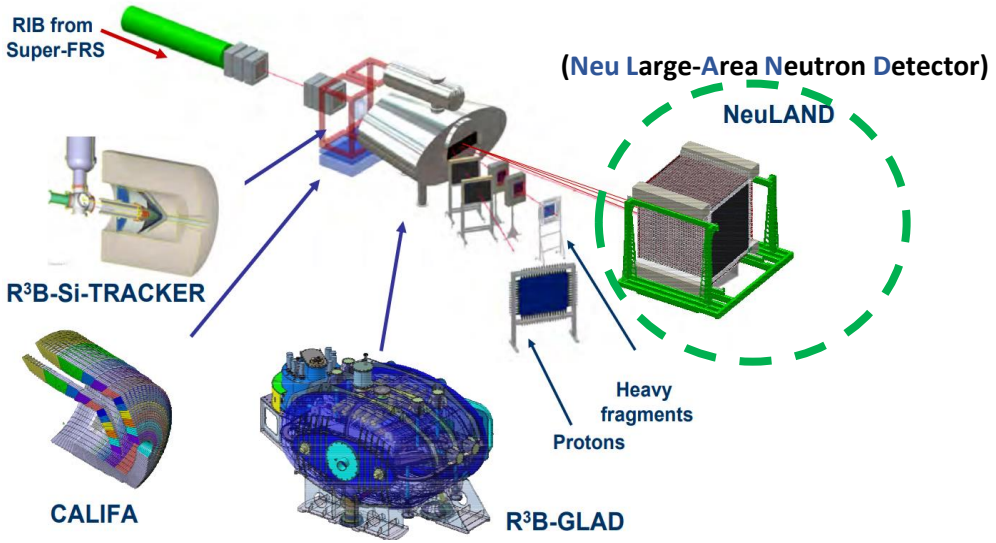

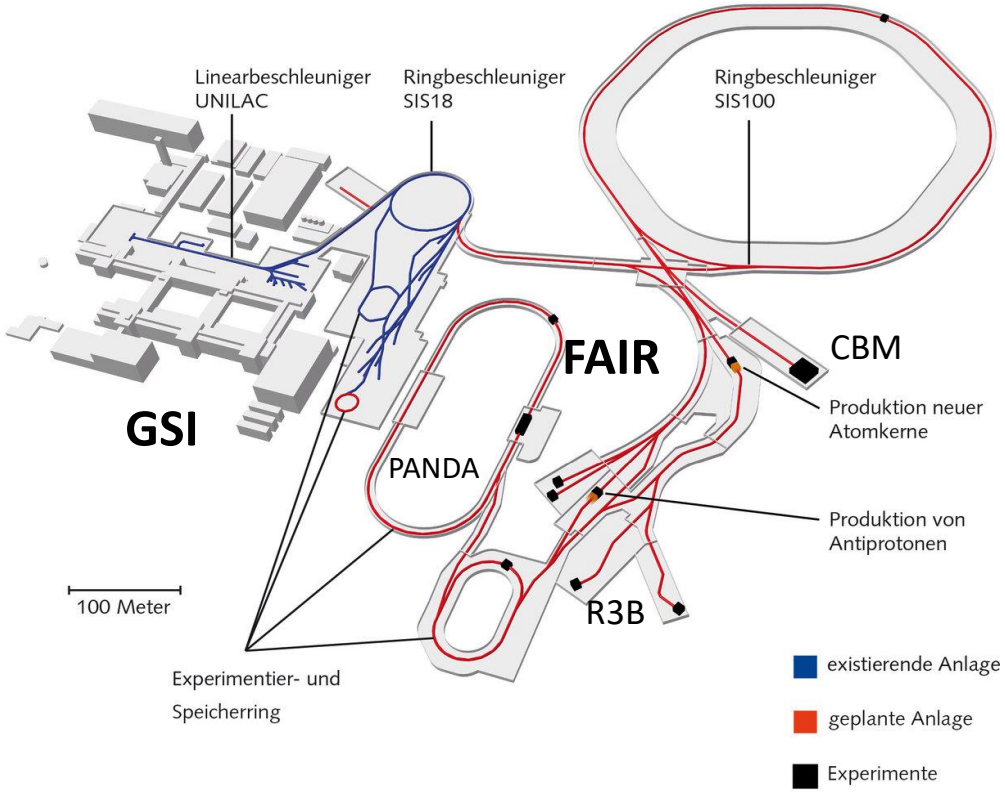

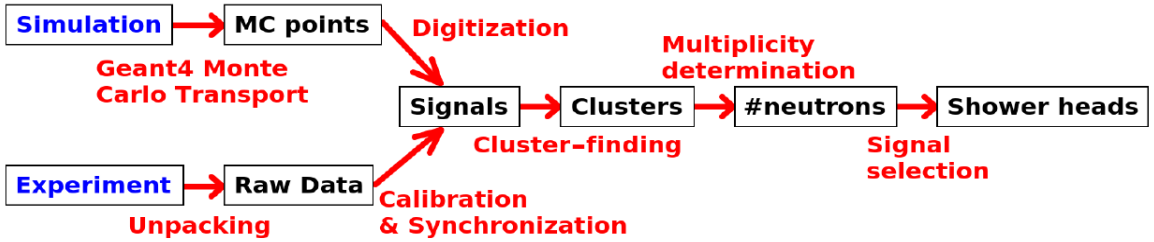

- Multiplicity determination
- Shower head determination

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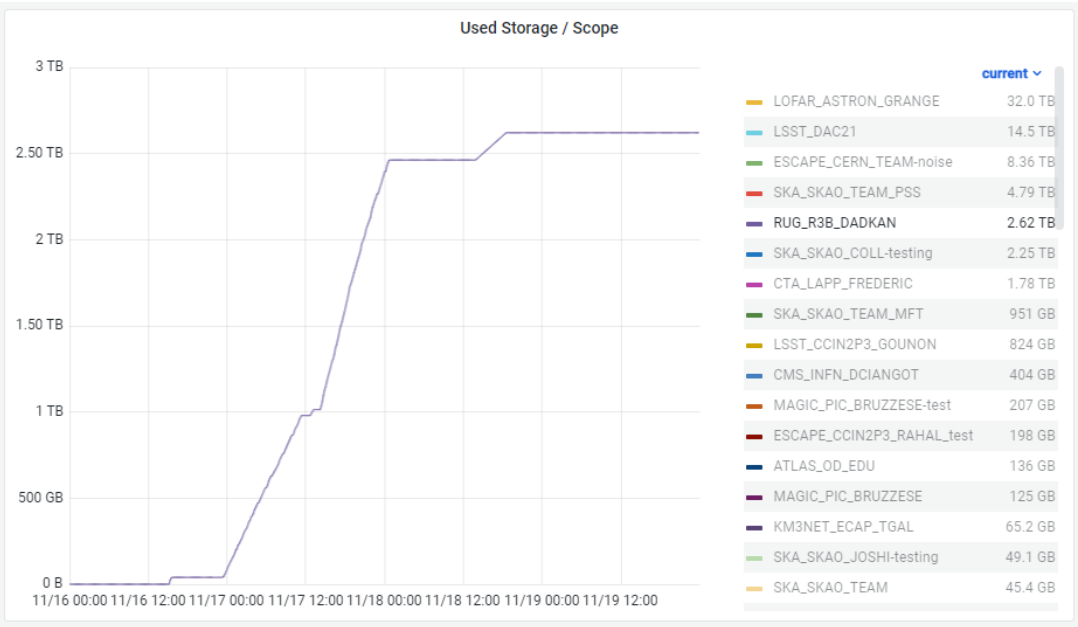
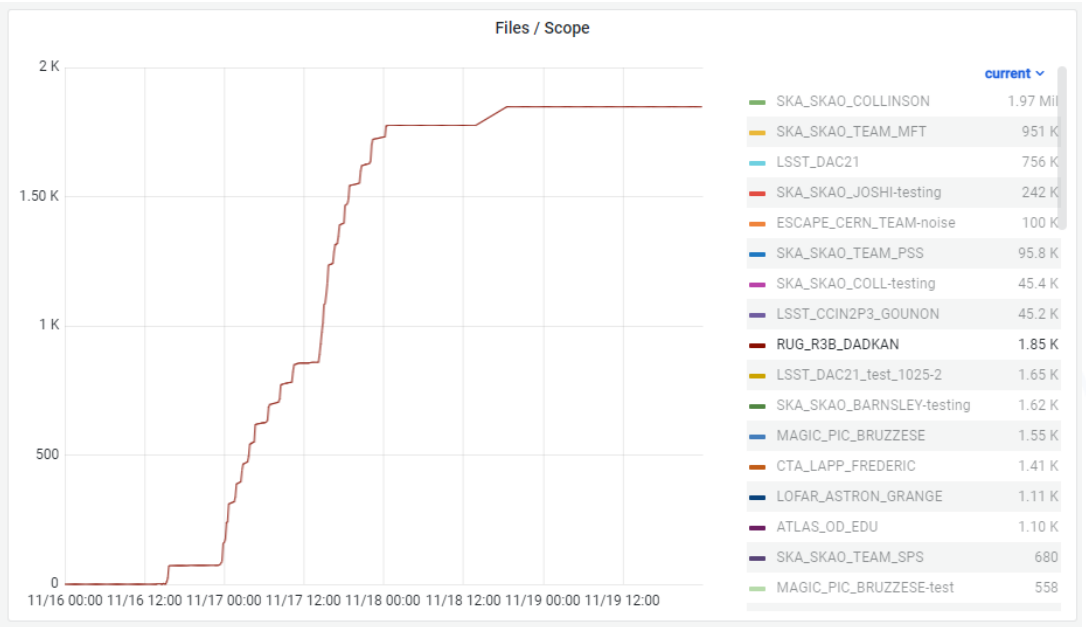
File transfer

	Volume of data	Type of data	Number of files	Method	lifetime	RSEs (or QOS)
Ingestion	2.6 TB	.root	~1800	RUCIO Python & RUCIO CLI	9 months	FAIR-ROOT, GSI-ROOT, EULAKE-1
Replication	2.6 TB	.root	~ 1800	RUCIO CLI	• 1 replica,14 days • 1 replica, 9 months	• CHEAP-ANALYSIS • CHEAP-ANALYSIS





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Analysis

Analysis notebook for NeuLAND-DNN data

In this notebook we will show the capability of using Jupyterhub on a user-defined kernel (here is FairRoot & R3BRoot) as user interface (UI) to anal
use PyRoot (a python interface for importing ROOT classes) for data analysis. The data are from

note : Please use python3 syntax in this analysis code

At the first we need to load the required libraries. Since we would like to use pyroot, we need to load ROOT libraries as well. Also, a help macro was developed by me to do some gen
calculating average, and set general styles for data visualizations. In this notebook, we will do analysis to extract 4-neutron invariant mass difference to compare different analysis me

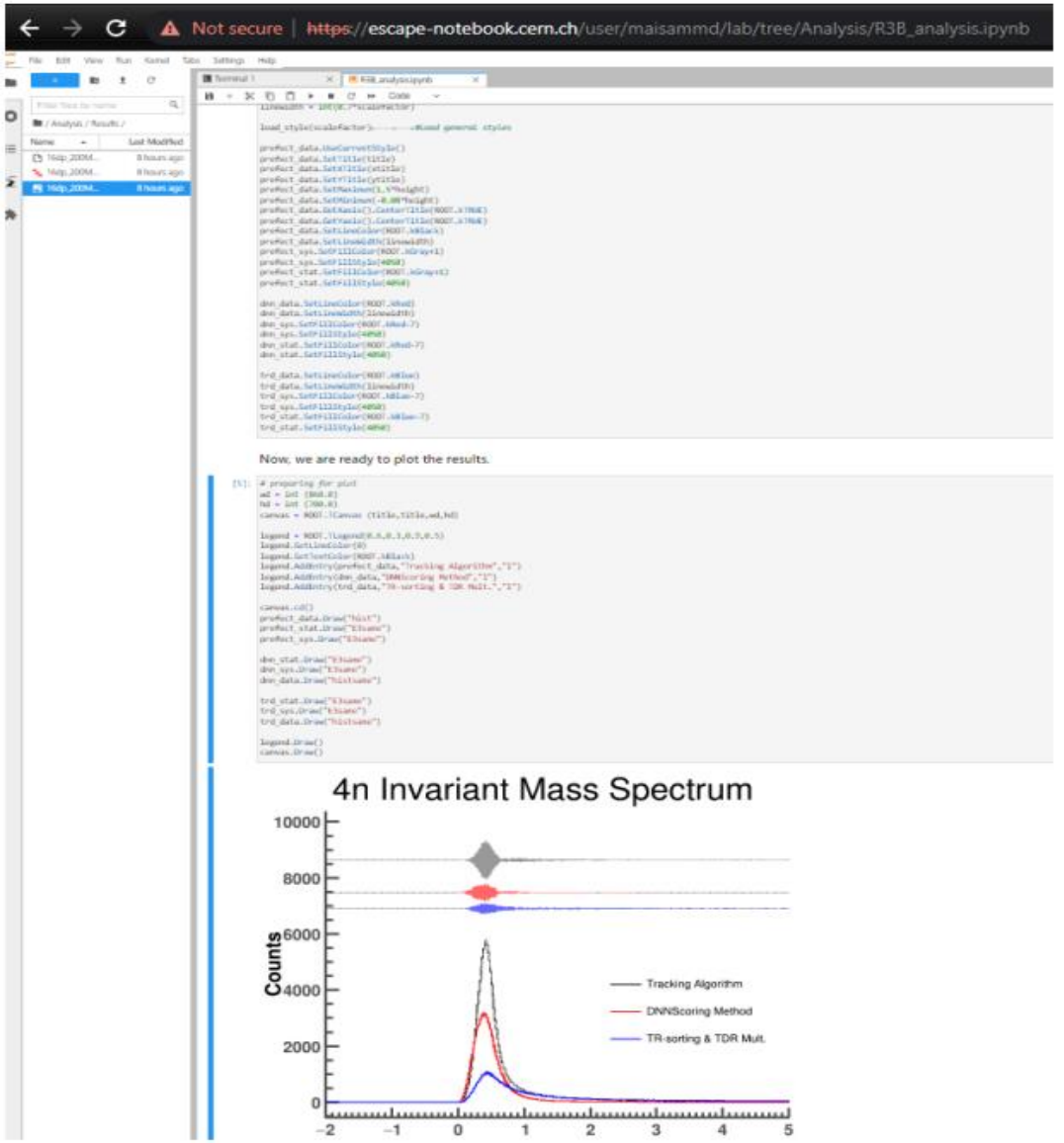
```
[ ]: import os
import sys
import subprocess
import ROOT
import math
import help
from os import path
from rucio.client.downloadclient import DownloadClient
from help import load_files
from help import get_avr_err
from help import get_scale
from help import load_style

doubleplane = 23
energy = 600
```

First of all, lets download the data from the ESCAPE datalake

```
[ ]: down_client = DownloadClient()
scope_name = "RUG_R3B_DADKAN"
file2ndINCLXX = "TetraNeutron_InvMass_%ddp_%dMeV_2ndINCLXX.root" %(doubleplane,energy)
fileBERT_BERT = "TetraNeutron_InvMass_%ddp_%dMeV_BERT_BERT.root" %(doubleplane,energy)
```

- DLaaS was used (ROOT environment)
- X509 for Download/Upload data
- The neuteron invariant mass difference for three different analysis methods.



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Leasons learned

Pros...

- Fast data ingestion/replication
- Rules and QOS features
- Python and CLI interfaces
- Support different AuthN/Z methods
- Simple namespace & naming scheme
- Monitoring of DL (Grafana)
- Discussion of technical aspects of data management within the research communities

Cons...

- Difficult to setup a Rucio client (unexprienced user)
- OIDC is not supported (yet!) for download-upload (only X509)
- Duplicate file name stop the ingestion process
- Some funtionalities do not work in Python interface (e.g attaching files to a dataset while uploading)
- Documentation of RUCIO DL and other related services

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Suggestions for improvement

- Improve the RUCIO error messages (especially in Python interface)
- End-to-end AuthN/Z
- A comprehensive and detailed documentation of RUCIO (client & server)
- Query based on metadata
- New concepts of metadata are needed to ensure reproducibility

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Other remarks

Your ESFRI/RI plans regarding the technologies exposed in DIOS, will you consider continue exploring or adopting?

- Depends on our future collaboration with ESFRIs
- Using DLaaS for long term or deploy our DLaaS instance

Did you identified security issues? Any specific security related worries to name (present or future) ?

- Nothing so far!

Is your ESFRI/RI Interested in a longer term existence of an ESCAPE or an ESCAPE-like infrastructure?

- Sure, having a sort of DL infrastructure would be helpful for our current and future collaboration with ESFRIs

Is your ESFRI/RI interested establishing standing collaborations, channels, joint efforts?

- Synergy between ESFRI's representitives at RUG (ASTRON, FAIR-GSI, ...) in RDM & DMS

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Thanks to:

- **All the WP2 colleagues**
- **Rizart, Riccardo, and Xavi**
- **FAIR-GSI colleagues**
- **RUG-IT department**

Thank you!
&
Questions?

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