PARALLELIZATION OF RAW DATA DECODING

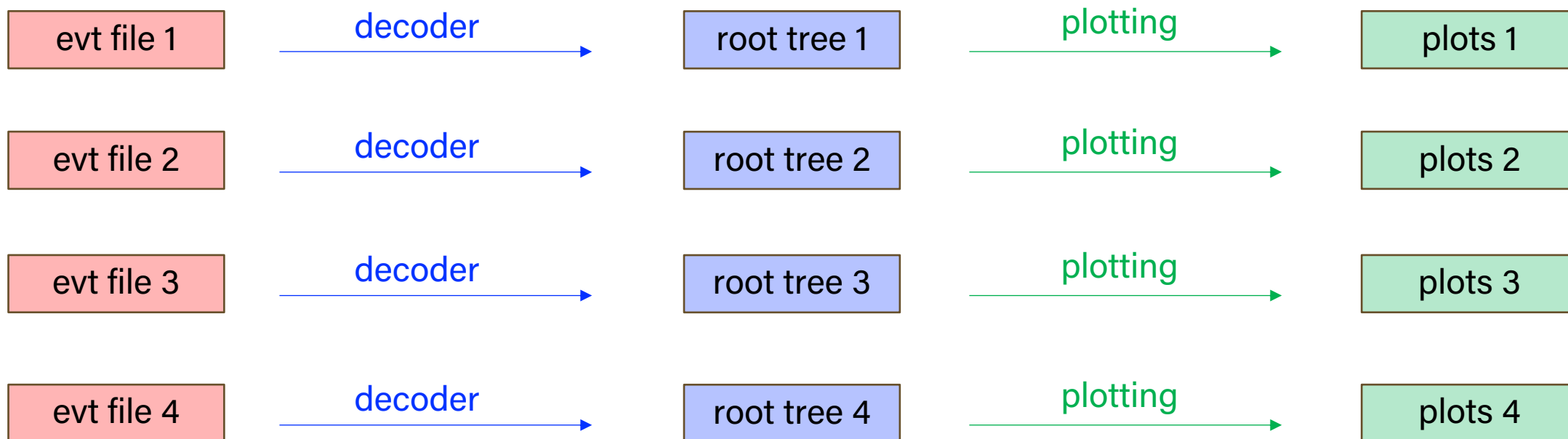Milan Stojanovic

06/29/2023
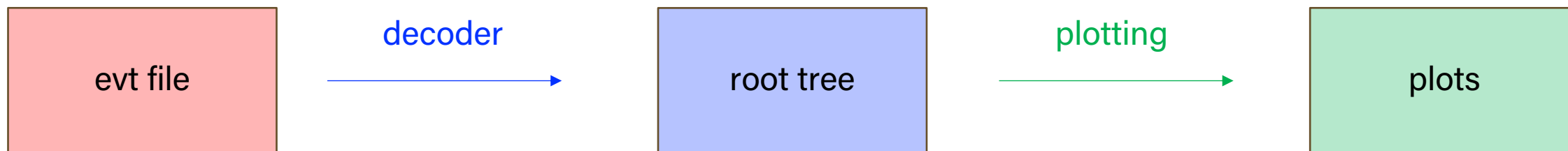
PURDUE
UNIVERSITY®

Overview

Current workflow:

Decoder: /sphenix/tg/tg01/commissioning/INTT/work/jbertaux_sPHENIX_home/*
Plots: /sphenix/tg/tg01/commissioning/INTT/work/misaki/FelixQuickViewer_1Felix.C

Overview

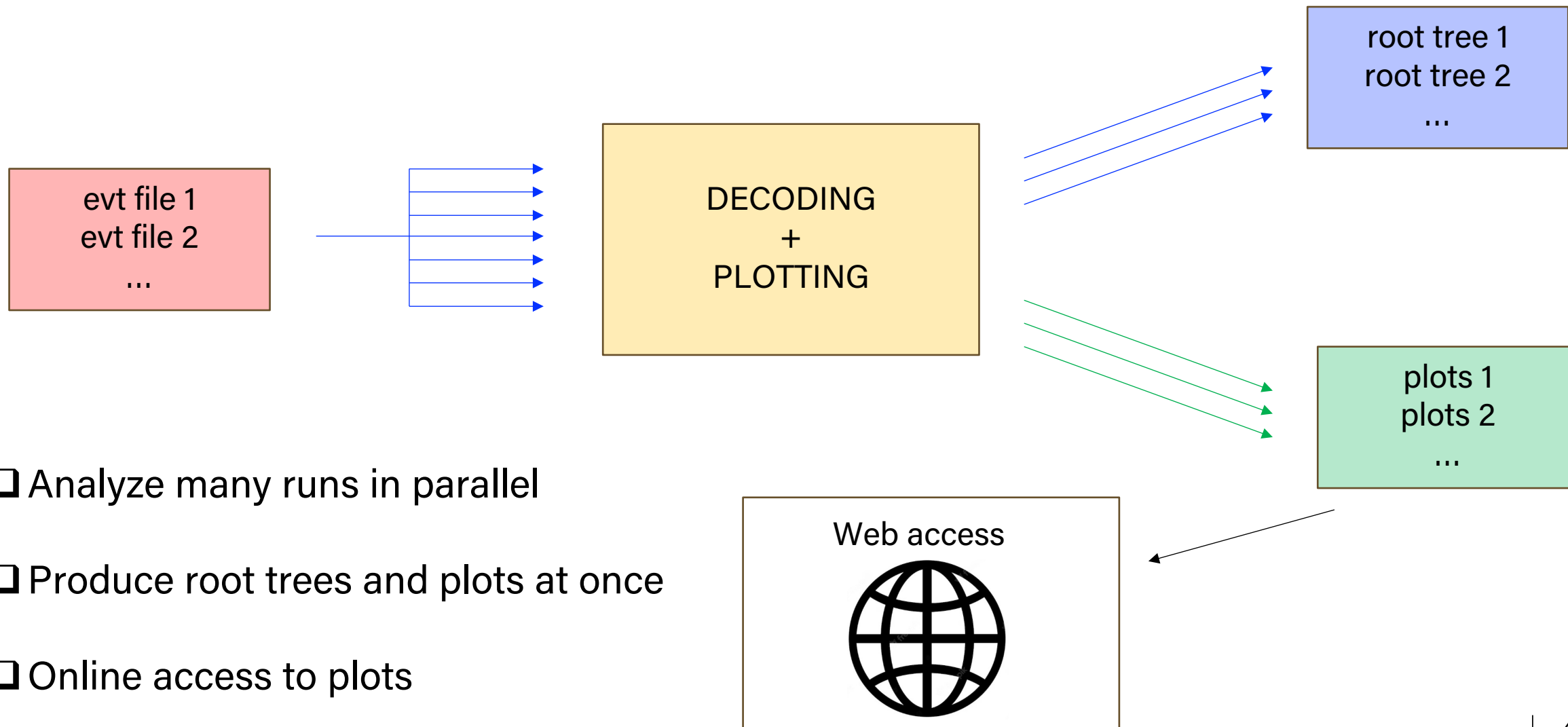| evt file 1	→ decoder →	root tree 1	→ plotting →	plots 1
evt file 2	→ decoder →	root tree 2	→ plotting →	plots 2
evt file 3	→ decoder →	root tree 3	→ plotting →	plots 3
evt file 4	→ decoder →	root tree 4	→ plotting →	plots 4

Current workflow:

Decoder: /sphenix/tg/tg01/commissioning/INTT/work/jbertaux_sPHENIX_home/*
Plots: /sphenix/tg/tg01/commissioning/INTT/work/misaki/FelixQuickViewer_1Felix.C

NEEDS TO BE DONE FOR EACH FILE SEPARATELY!

Parallelization

evt file 1
evt file 2
...

DECODING
+
PLOTTING

root tree 1
root tree 2
...

plots 1
plots 2
...

Web access

❑ Analyze many runs in parallel

❑ Produce root trees and plots at once

❑ Online access to plots

Parallelization

❑ Scripts:
`/sphenix/u/mstojano/rawdecoder/decoder_v2/`

❑ To produce root trees & plots:
`./executable.sh /path/to/the/input/file.evt`

❑ Runing many files in parallel → Condor jobs

➢ Create list of input files you want to analyze
`infiles1.list`

➢ Submit jobs:
`./submitjobs.sh`

Parallelization

❑ The script `submitjobs.sh` submits one job for one file

❑ The both root and plots are stored in the:
`/sphenix/tg/tg01/commissioning/INTT/root_files/` (~1500 jobs done so far)

❑ The condor submission script:
   `start.sub`

 ➢ "longlunch" = 2 hrs (max runtime)

 ➢ It can be increased if needed

 ➢ Err, out, and log files are all being stored in local submission folder
  Needs to be changed!

```
executable     = RawDataDecoder_v11.sh
arguments(Core)= $(Process)
error          = err.$(Process)
output         = out.$(Process)
log            = foo_$(Process).log
+JobFlavour    = "longlunch"
```

❑ If you want to run several files at once, but locally:
`./RawDataDecoder_v10.sh`

Online access

❑ The web page: https://sphenix-intra.sdcc.bnl.gov/WWW/subsystem/intt/

❑ Original plots location is not on server.

➤ Currently I move them manually

❑ There will be many plots
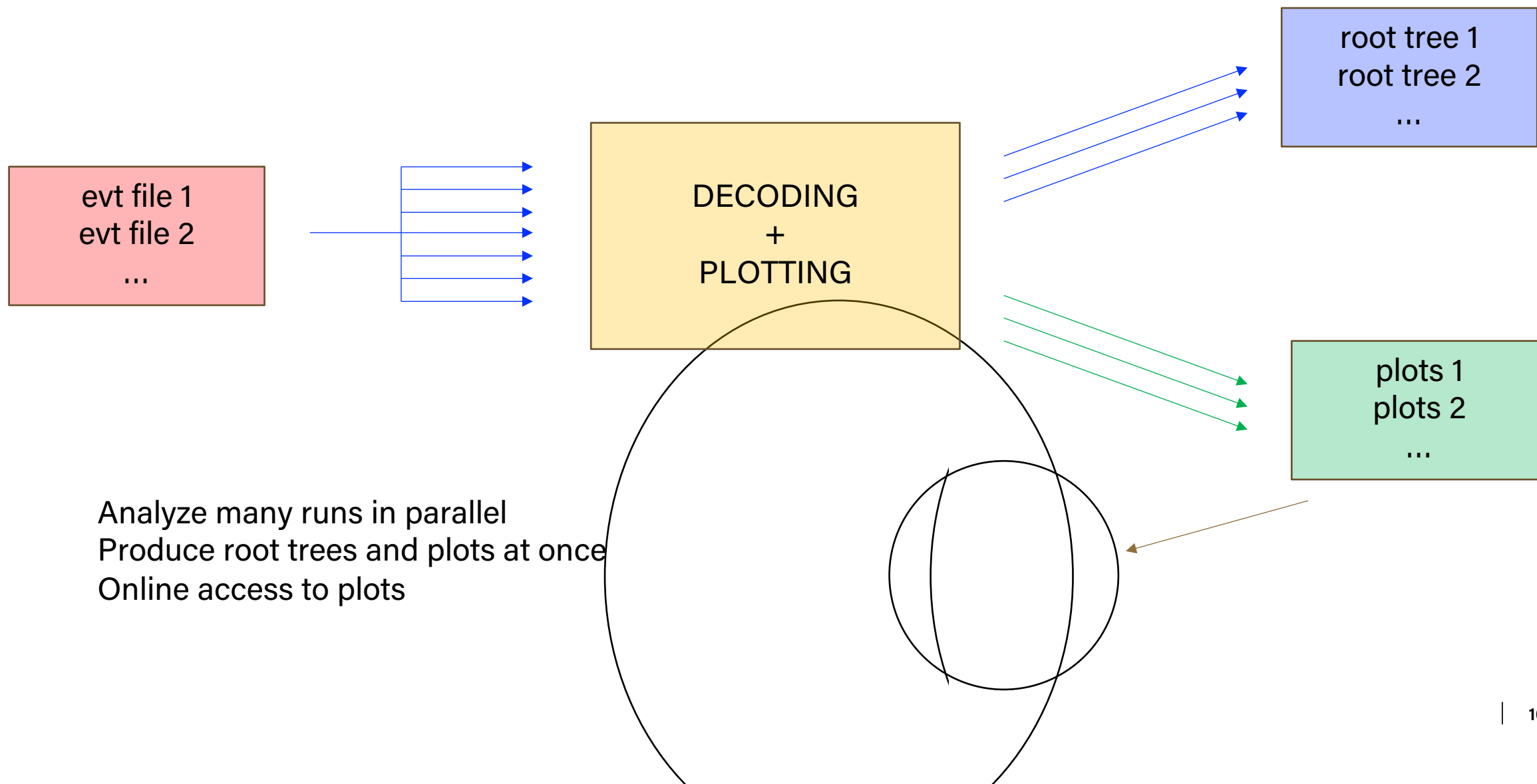
❑ Classification probably needs to re-established

To do

❑ Polishing the codes

❑ Macros name conventions

❑ Classification of the files

❑ More/less automation?

Web access

❑S

❑The script `submitjobs.sh` submits one job for one file

root tree 1
root tree 2
...

evt file 1
evt file 2
...

DECODING
+
PLOTTING

plots 1
plots 2
...

Analyze many runs in parallel
Produce root trees and plots at once
Online access to plots

CADI entries from 2021

❑ **HIN-21-003 [b → D0 vn in PbPb]** – Referee comments

❑ **HIN-21-006 [V0 femtoscopy in PbPb]** – Referee comments

❑ **HIN-21-010 [v2{2k}(k=1,…,5)]** – CWR ended

❑ **HIN-21-011 [HBT correlations in PbPb]** – **Ready for submission**

❑ **HIN-21-012 [cn{m}-<pT> correlations]** – CWR ended

❑ **HIN-21-013 [2pc in pp jets]** – **Approved**

❑ **HIN-21-017 [Charge balance function]** –FR hw

NEW CADI

❑ **HIN-22-005 [net charge fluctuations]** – **approved**

❑ **HIN-23-002 [cumulants in pP]** – pre-approved

❑ **HIN-23-003 [speed of sound in UCC]** – pre-approval comments

❑ **HIN-23-005 [vn up to v10]** – freezing this week?

PAG news

1) Strange hadron collectivity and femtoscopic correlations in pPb collisions at 8.16 TeV with the CMS experiment,   REJECTED
　　　　→ POSTER ?

2) Elliptic anisotropy measurement of the $f_0(980)$ in pPb collisions and determination of its quark content by CMS,   ACCEPTED

3) Search for longe-range QCD collective phenomena inside high-multiplicity jets in pp collisions with the CMS experiment,   ACCEPTED

4) Probing the dynamical evolution of QGP using charge-dependent correlations and fluctuations at CMS,   REJECTED
　　　　→ POSTER?

5) Study of Jets and Jet Medium interaction using two-particle correlations,   REJECTED
　　　　→ DROPPED

6) $\mathrm{K^{0}_S}$ and Λ ($\bar{\Lambda}$) two-particle femtoscopic correlations in PbPb collisions with the CMS experiment,   REJECTED
　　　　→ POSTER

7) Measurement of azimuthal anisotropy at high p_T using subevent cumulants in pPb collisions at CMS,   REJECTED
　　　　→ MERGED with jet suppression in pPb

8) Measuring flow harmonics up to order 10 and multiparticle correlations in PbPb collisions with the CMS experiment,   ACCEPTED

9) Extracting the speed of sound in the strongly-interacting matter created in relativistic nuclear collisions with the CMS experiment,   ACCEPTED

10) Flow harmonic measurements up to order 10 in PbPb collisions with CMS (POSTER)

BACKUP SLIDES

PAG News

1) Conferences

❑ HIN Workshop
- o Trento, Italy, May 29-Jun 1, Hybrid
- o Registration : link

❑ Initial stages
- o June 19-23

❑ Quark Matter
- o Houston TX, USA, September 3-9
- o Abstract submission summary
  - o 9 talk abstracts submitted
  - o 1 poster abstract
  - o +1 abstract in spectra group (Test data analysis, vn + dN/deta)

❑ International Symposium on Multiparticle Dynamics
- o Hungary, 21-25 Aug
- o Early registration deadline May 31
- o Abstract deadline: June 30

❑ EPS-HEP2023
- o Aug 21-25
- o Early registration deadline May 30
- o Abstract deadline May 21

PAG News

2) Run 1&2 Review Paper

- ❏ Possibility to submit a few review papers of O(100) pages in Phys. Rep. (2021 IF of 30)
- ❏ Subject: CMS Runs 1&2 results with an eye on Run 3&beyond
- ❏ First draft by May 19th
- ❏ Similar reports: link

2) HIN WS talks (speakers needed)

- ❏ 25 mins - New insights from flow-related analyses in large collision systems
- ❏ 25 mins - Interesting new flow analyses in small systems
- ❏ 10 mins - Enhancing technical consistency in flow analysis
- ❏ 30 mins - Physics questions for run 3 and discussions

PAG News

1) New meeting time

- ❑ 3pm GVA time
  - ❑ or: 8pm central time

2) Run 1&2 Review Paper

- ❑ Possibility to submit a few review papers of O(100) pages in Phys. Rep. (2021 IF of 30)
- ❑ Subject: CMS Runs 1&2 results with an eye on Run 3&beyond
- ❑ Please contact us if you are willing to contribute
- ❑ Similar reports: link

PAG News

3) HI Run(s)

- ❑ pp ref starts on September 21st
  - ❑ 5 days of pp collisions

- ❑ PbPb starts on October 2nd
  - ❑ 27 days of PbPb collisions
  - ❑ Energy still TBD

- ❑ What about pPb
  - ❑ In Run3 (2024) or Run4?

- ❑ OO/pO collisions
  - ❑ 2024, not in HIN run time
  - ❑ Do we need pp reference?