Laboratoire de Physique de Clermont Auvergne

Romain Madar

ATLAS France CAF-user meeting
28th November 2024

Team by end 2024

Composition of the team

→ *5+1 CNRS, 1 Prof, 1 CPJ, (1 Post-doc), 3 PhD*

→ *ttbar resonances, di-Higgs search, BSM with ML, Long Lived Particles*

Involvement of the team in computing

→ *local T2 (staff IR)*

→ *upgrade MC samples production*

→ *PMG software tools (CrossSectionTool, CrossSectionDatabase…)*

Involvement of the team in software

→ *analysis frameworks development/maintenance*

→ *monitoring framework (Tile) maintenance (staff IR)*

→ *calibration framework (HGTD) development*

Computing resources in 2024-2025

Pledged Tier 2 grid resources (2024)

- storage = 2914 TBytes in 2024 (update to 3400 TB in 2025)
- computing = 25000 HS23 in 2024 (update to 28000 HS23 in 2025)

Other non pledged grid resources

- storage = 22 TB i.e LOCALGROUPDISK in 2024 (will not increase in 2025)
- computing = 3500 HS06 in 2024 (not used)

Other local (lab, university) resources

- storage: 180 TB
- computing: servers+batch cluster (312 cores / 700 GB RAM)
- high performance computing : 1 server with V100 GPU

Analysis and needs

ANA-EXOT-2023-04 (diphoton déplacé) + ANA-EXOT-2024-23 (jet déplacé + top)

Louie C. (CJ), Abdelhamid H. (PhD), Bruna P. (Postdoc)

Contributions software

- development des derivations (DAOD_LLP1, on ne peut pas utiliser DAOD_PHYS)
- development du software ntuples et jobs (vraisemblablement TopCPToolkit)
- development du code histogramme et analyses stat

Model, input and amount of data

- AOD -> DAOD_LLP1 (custom) -> nutple
- environ 150 /fb of Run3 data

Where it will be performed:

- CERN lxplus, and possibly CC-IN2P3 (we are looking into this)

Expectations

- alm9 machines to be able to use CC-IN2P3

Analysis and needs

Hhbbgg

Louis D'E.(CR), Arthur L. (PhD), Nicolas C. (PhD)

- *Framework :* Easyjet relies on DAOD_PHYS and PHYSLITE.

- *Processing time :* 2/3 days nominal, up to 1 week with systematics

- *Analysis location :* jobs submitted to grid. Possible to run test jobs on lxplus.

- *Difficulties :* long run for grid jobs with systematics: some jobs queue for long time + jobs taking too long to finish -> some optimisation needed.

- *Louis responsabilities:*
  * Upgrade MC production contact.
  * Easyjet framework developper (up to 15th of November 2024) : main framework for HH analyses and way more: HBSM but also interest from CP teams to get a fast ntuple dumper from PHYS(LITE).

- *Forseen evolution:* transfert 'Upgrade MC production contact' to Adrien (postdoc)

Analysis and needs

ttHH

Djamel B. (DR), Romain M. (CR), Adrien A. (Postdoc), Arthur L. (PhD)

No major contributions, just code modifications + local event generation (very analysis-specific).

Recherche d'Anomalies

Julien D. (PR), Samuel C. (CR), Bruna P. (postdoc), Eva M. (PhD), Andres D. B. (PhD)

- group contribution: histogram production, ML training, ML development
- input : ntuples
- time to process : few hours to days
- where is it performed: Local, considering CC-IN2P3 (due to GPU's)
- physics use case: anomaly detection (2 analyses)
- good points/difficulties/needs/expectations : analyses type 'machine learning'
- using GPUs ?
    * Yes (1 analyse will do).
    * Possibily using several GPU in parallele to process of the (large-R?) jets in Atlas

- CC-IN2P3 GPU farm next year ? Likely yes, do not know yet which need exactly

- Forseen evolution : Increasing need of GPU

Details on Software involvement

Name	OTP	Activity	System	Task	FTE
S. Binet	X	Computing/Software	TileCal	HV monitoring software development	0.15
~~A. Burger~~	~~C3~~	Computing/Software	General tasks	Reconstruction	~~0.10~~
~~A. Burger~~	~~X~~	« Analysis support »	VLQ analysis group	Analysis group framework, ntuple production	~~0.10~~
~~O. Perrin~~	~~X~~	« Analysis support »	Hh multilepton analysis group	Analysis group framework, ntuple production	~~0.10~~

+ Louis D'Eramo :
  → EasyJet co-coordinator (up to 11/2024)

Details on Computing involvement

Total computing involvement = 0.70 FTE

Name	OTP	Activity	System	Task	FTE
J.-C. Chevaleyre (not in OTP)	C4	Computing/Software	General Tasks	FR LPC, Clermont	0.70

+ Louis D'Eramo :
  → Contact Upgrade MC sample production (likely to be transferred to Adrien)