LPNHE Paris

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ATLAS France CAF-PAF meeting
28th November 2024

Team by end 2024

Composition of the team

→ ***team: 6 EC - 8 CNRS (+1 « émérite ») - 3 postdoc - 6 PhD (+ 4 co-direction)***
- 14 IT (6.4 FTE) on ITK & HGTD
- 1 IT (0.5 FTE) on grid

→ ***analyses:***

Higgs boson : channels with b-jets, diHiggs + Jet/Etmiss perf.
DM research : mostly ALPs (prompt vs LLP) + egamma perf.
Jets : inclusive jet and dijet x-sec, sub-structure (Lund-jet plane) + JES/JER perf.
Top quark : mass/b-fragmentation

S&C involvement 2024

S&C Institutional Commitments

Information taken from *OTP report*

→ Activity= «Computing & Software »

System	Activity	Task Id	Task	Requirement Id	Requirement	Funding Agency	Institution Id	Institution	Description		Committed [FTEs]	Allocated [FTEs]	Task Requirement [FTEs]	Committed Fraction of Requirement [%]
PIXEL	Computing/ Software	531773	Software Development/ Maintenance and Physics Performance	555533		France IN2P3	107	Paris LPNHE	Offline software, rad damage, performance studies.	0.15	0.03	6.26	2	

~ still miss ~0.1 FTE – expertise to be rebuild

Involvement of the team in computing

~ 1.5 FTE constant since several years

Physicist: CAF+FR-cloud (0.45 FTE C3) + GRIF-LPNHE (0.1 FTE C4)
shift computing (0.17 FTE C2)

Engineers: 1IR GRIF-LPNHE (0.65 FTE Class 4)
(1 IE from SU left to IRFU,
wait for CDD at some fraction of his time on cloud)

Involvement of the team in software

1.24 FTE, was 1.24 FTE in 2023, 0.37 FTE in 2022, 1.28 FTE in 2021

Physicist FTE: upgrade ~0.2, detector ~0.84, reco/analysis ~0.40

Computing resources in 2024-2025

Pledged Tier 2 grid resources (2024)

- storage = 2050 TB (**+0% in 2025**)
- computing = 20350 HS23 (i.e ~2300 cpu) (**+0% in 2025**)
- network : 20 Gbps ⇒ expect 40 or 100 Gbps soon (already written last year!)

Other non pledged grid resources

- storage = 1150 TB in LOCALGROUPDISK
- computing >10000 HS23 through fairshare of GRIF-LPNHE site

Other local (lab, university) resources

- local storage : ~90 TB attached to local server (ceph)
- local computing : 1 group server with 16 cores (32 in hyperthread),
- Cloud : ~300 cores bought in summer 2021 for all lab
  computing : not used !
  Juypterhub : for students/internships
  service : monitoring of local rooms (temp., humidity) at cloud@LPNHE
  ITK localDB at cloud@IJCLab
- GPU +High Performance Computing :
  - several actors/resources nearby at universities but not easy to use

Analysis and needs

Detector studies (local/CERN)

→ pixels & HGTD studies : resource level and usage similar to last year
⇒ ITk LocalDB done on IJCLab & LPNHE cloud resources

Performance studies (local/CERN/CC-IN2P3/GRID)

→ jets & b-tagging studies : resource level and usage similar to last year

Analyses studies (local/CERN/CC-IN2P3/GRID)

→ Higgs studies : resource level and usage similar to last year
→ Top studies : local + use of CC-IN2P3 batch/sps

Analyses using Machine Learning / GPU

→ egamma perf : NN for online electron filtering, cross-talk, calibration : done of GPUs at CC-IN2P3 and Brasil cluster
→ Jet perf : jet calibration with NN (QT of L. Boggia) done on CERN GPU
→ unfolding studies (A. Butter, B. Malaescu) : on GPUs CERN+Heidelberg
→ asked for 2 months-GPU use at CC-IN2P3 farm in 2024, but no use ...

Near future

Activities of the team

→ evolution: stable in the 2 coming years

Resources and needs

→ limited amount of computing ressources locally (not counting grid)

→ effort in laboratory for ML/IA in the coming years: training etc.
- Jupyterhub available at LPNHE since June 2023
- continuation of e/gamma-like ML studies by other/new students
- Jet & unfolding studies to be done also at CC-IN2P3 ?

→ cloud@LPNHE : lost in Sep. main engineer who developed cloud infrastructure; now totally depends on possibility to hire an engineer in CDD who was “apprenti” last two years

→ cloud@IJCLab : for ITk localDB has shown single point of failure when flood in Orsay ==> Need a mirror of the infra., at CC-IN2P3 ?

→ needs for HGTD production database, deployed where ?

→ needs for storage/computing at CC-IN2P3 :
no major change in the use of CC-IN2P3

LPNHE software involvement

Information taken from OTP report
Software involvement = 1.00 FTE S&C+AS = 0.27 FTE)
(Core=0, Upgrade=0.20, Data/Detector=0.65, Ana/Reco=0.15)

Itk: 0.20 FTE (Upgrade=0.20) [S&C+AS=0]

Name	OTP	Activity	System	Task	FTE
F. Derue	C3	Detector Operation	General Task	Phase-II ITk Pixels (Production DB, cloud)	0.20

Pixel detector: 0.12 FTE (Data/Detector=0.12) [S&C+AS=0.12]

Name	OTP	Activity	System	Task	FTE
G. Calderini	C3	Computing/Software	Pixel	Software Development/Maintenance and Physics Performance	0.12

Reco/Ana: 0.68 FTE (Data/Detector=0.53, Reco/Ana=0.15) [S&C+AS=0.15]

Name	OTP	Activity	System	Task	FTE
B. Malaescu	C3	Computing/Software	General Task	Analysis Model Group	0.15
B. Laforge	C3	Data Preparation	General Task	Offline DQ Monitoring Software & Debugging – Egamma,Jet,Calo	0.03
E. Purcino De Souza	C3	Data Preparation	General Task	Offline DQ Monitoring Software & Debugging -- Egamma	0.05
B. Laforge	C3	Trigger	General Task	Egamma Software and Performance	0.30
E. Purcino De Souza	C3	Trigger	General Task	Egamma Software and Performance	0.15

LPNHE computing involvement

Information taken from OTP report
Total computing involvement = 1.31 FTE (0.11 C2, 0.45 C3, 0.75 C4)
(also LCG-FR)

Class 2 : 0.11 FTE

Name	OTP	Activity	System	Task	FTE
Sophie Trincaz-Duvoid	C2	Computing/Software	General Tasks	ADCoS Senior shifts	0.07
Mélissa Ridel	C2	Computing/Software	General Tasks	ADCoS Senior shifts	0.04

Class 3 : 0.45 FTE

Name	OTP	Activity	System	Task	FTE
Frédéric Derue	C3	Computing/Software	General Tasks	Cloud Operation & Management / Cloud squad	0.45

Class 4 : 0.75 FTE

Name	OTP	Activity	System	Task	FTE
Aurélien Bailly-Reyre	C4	Computing/Software	General Tasks	FR GRIF, Paris	0.15
Frédéric Derue	C4	Computing/Software	General Tasks	FR GRIF, Paris	0.10
Victor Mendoza	C4	Computing/Software	General Tasks	FR GRIF, Paris	0.50