CPPM

ATLAS France CAF-user meeting - Lyon, CCIN2P3

Timothée Theveneaux-Pelzer, Arnaud Duperrin

CPPM – CNRS/IN2P3 – Aix-Marseille Université

Thursday, November 28th 2024

Team by the end of 2024

- Composition of the team
  - → 4 MCF/PR [1.5 FTE]
  - → 10 CR/DR [7 FTE] (+1 in 2025)
  - → 1 IR computing [0.5 FTE]
  - → 7 PhD students (1 co-tutelle, end in 2024)
  - → 2 post-docs (1 ending in 2024)
- Changes :
  - → TTP taking over Arnaud Duperrin as CAF contact
  - → Arnaud Duperrin taking over Marlon Barbero as Team Leader (on 01/01/2025)
- Physics analyses
  - → $HH(bb\tau\tau)$ Run 3 - ANR DIVE
  - → $HH/SH(bb\gamma\gamma)$ Run 3 (Run2 paper is out)
  - → other analyses : H^{++} ML, SUSY RPV multi-bjet
- Involvement in computing - local T2 CPPM
  - → 1 IR (0.5 FTE - Edith Knoops) + help from another IR (Carlos Carranza)
  - → CNRS (0.05 FTE - Arnaud Duperrin) + collaboration with LHCb (Andrei Tsaregorodtsev)
- Involvement in software
  - → CP (Run 3 and Run 4) : trigger, b-jets, Egamma, tracking
  - → Physics Analysis frameworks, AMG
  - → Releases : MC production, reconstruction, validation, git merge request reviewer
  - → Run 3 pixel software

OTP : categories "Software" or "Analysis support" or "Trigger"

Institutions	First Name	Last Name	Activity	System	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Alloc
Marseille CPPM	Fares	Djama	Computing/Software	PIXEL	Software Development/Maintenance and Physics Performance	0.16	0.15	0.16	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Marseille CPPM	Arnaud	Duperrin	Analysis Support	General Tasks	Performance Studies - Flavour Tagging	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Marseille CPPM	Arnaud	Duperrin	Computing/Software	General Tasks	Cloud Operation & Management	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Marseille CPPM	Lorenzo	Feligioni	Trigger	General Tasks	Bjet Software and Performance	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Marseille CPPM	Minori	Fujimoto	Computing/Software	General Tasks	Reconstruction	0.00	0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Marseille CPPM	Elemer	Nagy	Trigger	General Tasks	Bjet Software and Performance	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Marseille CPPM	Thomas	Strebler	Analysis Support	General Tasks	Performance Studies - Tracking CP	0.05	0.00	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Marseille CPPM	Thomas	Strebler	Computing/Software	General Tasks	Analysis Model Group	0.61	0.57	0.61	0.59	0.61	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.30
Marseille CPPM	Thomas	Strebler	Computing/Software	General Tasks	GIT merge request review, Level 1	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.00	0.00	0.02	0.00	0.00	0.01
Marseille CPPM	Thomas	Strebler	Computing/Software	General Tasks	GIT merge request review, Level 2	0.08	0.08	0.08	0.12	0.13	0.08	0.00	0.07	0.10	0.12	0.08	0.08	0.08
Marseille CPPM	Thomas	Strebler	Computing/Software	General Tasks	Reconstruction	0.16	0.10	0.16	0.16	0.16	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Marseille CPPM	Thomas	Strebler	Computing/Software	ID gen	Common Tracking Software	0.31	0.29	0.31	0.30	0.31	0.30	0.41	0.41	0.39	0.41	0.39	0.41	0.35
Marseille CPPM	Timothee	Theveneaux-Pelzer	Analysis Support	General Tasks	Generator Software	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Marseille CPPM	Timothee	Theveneaux-Pelzer	Analysis Support	General Tasks	Performance Studies - Egamma	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Marseille CPPM	Grigorii	Tolkachev	Analysis Support	General Tasks	Performance Studies - Egamma	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Marseille CPPM	Grigorii	Tolkachev	Computing/Software	General Tasks	Analysis Model Group	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marseille CPPM	Jozsef	Toth	Computing/Software	General Tasks	Validation of software release	0.20	0.19	0.20	0.20	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.10
						2.16	2.01	2.17	2.18	2.23	2.15	0.42	0.47	0.49	0.54	0.48	0.49	1.32

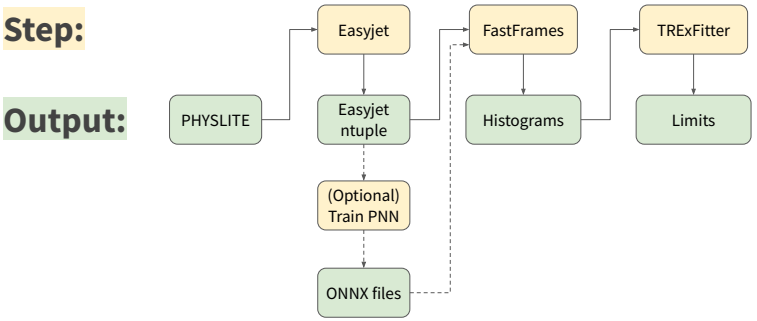
⇒ Full report here - second semester missing for most tasks

Computing resources in 2024-2025

- Grid resources Tier 2-ATLAS pledge for 2025
  - → Storage : 2 200 TB - same as in 2024
  - → Computing : 24 000 HS06 - same as in 2024
- Point of attention : several engineers involved in T2 will retire in the coming years
- Non-pledged resources
  - → 245TB on `IN2P3-CPPM_LOCALGROUPDISK`
- Other local (lab) resources (i.e. whatever is non grid)
  - → 5 local servers (3 with expired warranty) - 295TB, 284 cores
  - → CPPM has some GPU for developments/tests, shared among groups
  - → moving towards a cloud computing model at CPPM
    - ◇ aim to mutualize computing resources among groups
    - ◇ no more local group servers
    - ◇ currently allocated for ATLAS : 6 Virtual Machines, 55TB, 152 cores

Analysis and needs - example of Higgs pairs analyses

- Run2+Run3 $HH/SH(bb\gamma\gamma)$ and $HH(bb\tau\tau)$ using similar workflow
- Analysis software : Easyjet [gitlab]
  - → based on ATLAS CP algorithms
  - → see Georges' presentation this afternoon
- Input samples : `DAOD_PHYSLITE` (or `DAOD_PHYS`)
  - → centrally produced (analysis-specific i.e. signal samples need to be requested)
- Post-processing steps (histogramming) : various tools
  - → EasyJetPlus used by $bb\gamma\gamma$ - subpackage of Easyjet
  - → HHARD [gitlab] used by $bb\tau\tau$
  - → $SH(bb\gamma\gamma)$ moving to FastFrames [gitlab] - columnar analysis developped by TopWG



- Contributions :
  - → Thomas Strebler ⇒ Georges Aad : HHFramework (Easyjet) co-contact
  - → TTP : $SH(bb\gamma\gamma)$ analysis contact
- See also : Minori's presentation on GPU usage
  - → crucial for training of jet flavour-taggers (b-tagging/ITK, boosted $\tau\tau$ taggers)

Conclusions

- CPPM team :
  - → 6 physicists + 3 PhD students + 1 post-doc involved in physucs analyses
  - → no dedicated IT support - 1 IR (0.5FTE) mostly for T2
- T2 running smoothly
  - → computing ressources OK - Human Ressources need attention in the coming years
  - → uncertainty on financing + electricity cost
- Involvement in software
  - → increasing involvement in physics analysis software tools (Easyjet), AMG
  - → continuing contributions in e/gamma, b-tagging, trigger, tracking