

APC Paris

***G. Marchiori
for the APC team***

ATLAS France CAF-PAF meeting
9th December 2021

Composition of the team

- *team: 1 EC - 2 CNRS - 5 PhD (2 cotutelles) - 1 post-doc joining early 2022*
- *(current) analyses/activities:*
 - *Higgs boson:*
 - *Higgs to bb (couplings/xsection measurements)*
 - *Higgs to 2 photons (fiducial xsection measurements)*
 - *Search for double Higgs to bb+2 photons (-> Higgs boson self-coupling)*
 - *Performance: photon identification, b-JET tagging and energy scale*
 - *Pixel radiation damage simulation in Athena; ITk digitisation software development*

Involvement of the team in computing

- *ADCOS shifts shifts computing*
- *Analysis Release shifts*

Staff IE/IR: 0

Staff physicist: 0.1

Involvement of the team in software

- *egamma derivation software development and group production*
- *Pixel software*

Staff IE/IR: 0

Staff physicist: 0.8

Computing resources in 2021-2022

« Grid » pledged resources in 2021

- storage = 0 TB in 2021 (will increase by 0% in 2022)
- computing = 0 HS06 in 2021 (will increase by 0% in 2022)

Other « grid » resources (*if available, correspond to non pledged resources*)

- storage = 0 TB i.e LOCALGROUPDISK in 2021 (will increase by 0% in 2022)
- computing = 0 HS06 in 2021 (will increase by 0% in 2022)

Other local (lab, university) resources (*whatever is non grid*)

- new HPC cluster "DANTE" being deployed: 640 CPU (Intel Xeon Gold 6230 2.1GHz 20C/40T), 2.3 TB RAM, divided in 16 nodes. 160 TB BeeGFS
- local team server also being bought (28 core, 512 GB RAM, Nvidia Quadro GV100, 20 TB HDD)

Analysis and needs

B-tagging calibration with pTrel method

- contribute to full analysis chain, from ntuple production to final results
- model: DAOD -> ntuples (180 GB) -> fit
- time to process: 24-30h
- where this analysis is mostly performed: CC-IN2P3 and CERN batch
- Good points: CC-IN2P3 has shorter and faster queue, larger quota than CERN.
- Difficulties: Recent change in batch system, need to adapt the submission files.
- Needs: need to adapt code to read data on CERN /eos through xrootd
- Expectation: is it possible to use same batch system (HT-Condor) as CERN?

VH(bb) STXS and b-jet energy scale calibration with template method

- contribute to full analysis chain, from ntuple production to final results
- model: DAOD -> CxAOD (smaller, calibrated DAOD produced centrally by analysis group) -> ntuples
- time to process: ~ 1 or 2 days
- where this analysis is mostly performed: grid + CERN, CC-IN2P3, local): both grid and batch jobs
- good points/difficulties/needs/expectations: appreciated move to slurm, makes it simpler to handle conditional submission of jobs based on (successful) exit status of previous ones

Analysis and needs

H(yy) (Higgs xsections, HH->bbyy)

→ contribute to full analysis chain, from ntuple production to final results

→ model: DAOD -> MxAOD (smaller, calibrated DAOD produced centrally by analysis group) (around 10 TB) -> ntuples (700 GB)

-> fits

→ time to process (MxAOD->ntuples): ~1 day (data + MC nominal + MC cyst.)

→ where this analysis is mostly performed: CERN batch

→ Good points/Difficulties/Needs/Expectation: nothing in particular

Near future

Activities of the team

→ 3 students + 1 post-doc recently joined, activities expected to double (in particular expand: ITk digitisation code; analysis on single and double Higgs, combination; more emphasis in the future on deep-learning tools)

Resources and needs

- no evolution of local resources anticipated
- future needs could include use of GPUs for training of NN

Details on Computing involvement

Information taken from [this link](#)

Total software involvement = 0.08 FTE

Name	OTP	Activity	System	Task	FTE
Gregorio Bernardi	C2	Computing/Software	General Tasks	ADCoS	0.01
Giovanni Marchiori	C2	Computing/Software	General Tasks	Analysis Release Shifts	0.07

Details on Software involvement

Information taken from [this link](#)

Total computing involvement = 0.8 FTE / year

Name	OTP	Activity	System	Task	FTE
Marco Bomben	C3	Computing/Software	PIXEL	Software Development/Maintenance and Physics Performance	0.2*
Romain Bouquet	C3	Computing/Software	General Tasks	Analysis Model Group	0.07*
Giovanni Marchiori	C3	Computing/Software	General Tasks	Group activities	0.15*

*: numbers should double when including 2nd semester (currently not included in these numbers)