



Technical validation of new developments and new cycles : *Mitraillette* & checkpack

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Outline



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Outline



Mitraillette	checkpack, ciboulette	Exercise
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Validation tool		

Mitraillette : what, how?

• *Mitraillette* : a collection of jobs, NCONF \in {1, 401, 501, 601, 901, 923, 927} with various geometries & model options.

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- How it works :
 - each test job has a proto-job (= template of script)
 - namelists for each job are stored for each cycle
 - there is a building script (mitraillette.x) that builds the actual scripts from *proto-jobs*, cycle and **binaries** to be used
 - input resources are taken from almost-hardcoded paths in the proto-jobs

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 - input resources are taken from almost-hardcoded paths in the proto-jobs
- Procedure for the user :
 - cd to mitraillette directory
 - 2 define a list of ${job \Leftrightarrow binary}$ to be used, in a file
 - Image: Imag
 - In the first job; if not crashed, it triggers the second one, and so on

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Just a bit of nomenclature

All jobs are named as a series of underscore-separated abbreviations, which define their content.

The first two are mandatory :

- discriminates ECMWF, Arpege and LAM :
 - GE : Global-ECMWF = IFS
 - GM : Global-MF = Arpege
 - L1 : LAM 1D model (\approx MUSC)
 - L2 : LAM 2D vertical-plan model
 - L3 : LAM 3D model
- **2** type of conf :
 - FCST : forecast
 - C923 : clim files conf 923
 - FPOF : fullpos (offline)
 - C601 : singular vectors
 - ...

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Just a bit of nomenclature

Following parts of name specify options to be tested, e.g.

- HYD vs. NHE : hydrostatic vs. elastic NH
- SL2/SL3/EUL : semi-lagrangian 2/3 tsteps, eulerian
- ADIAB/ARPPHYISBA/AROPHYSFEX : adiabatic, Arpege physics, Arome physics with Surfex

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- AROMALP1300/TL798S : 1.3km Alps domain, stretched T798 gauss
- VFE/VFD : vertical finite elements/differences
- PCC/PCF : cheap/full Predictor-Corrector scheme

• ...

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A raw tool		

Up to the user

- to launch next jobs when chaining is broken by crashed job(s)
- to compare the outputs of jobs to a reference : assert **bit-reproducibility** (of norms in listing), or **check differences** (in files) and understand where they come from

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• to deactivate chaining when re-running failed jobs

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 \Rightarrow ciboulette/checkpack :

towards more ergonomy and automated sanity checks

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A raw tool		

Up to the user

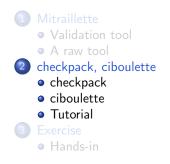
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checkpack		

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checkpack

checkpack.py takes :

- a cycle
- a *gmkpack* compiled pack
- a list of jobs (pre-defined lists exist)

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checkpack

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 $\bullet\,$ a list of jobs (pre-defined lists exist) and then :

• run Mitraillette (build jobs)

• launch the jobs with a mini-scheduler, more flexible than original chaining

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It's only a *handy wrapper* around Mitraillette.

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If you also give a reference, where to find outputs of Mitraillette execution on the reference cycle, it will trigger automatic comparisons :

 $\Rightarrow \texttt{ciboulette}$

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ciboulette

ciboulette takes

• test and reference Mitraillette job(s) output listings

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ciboulette

ciboulette takes

• *test* and *reference* Mitraillette job(s) *output listings* and then compares *norms* found in listings for each job. Norms comparison consists in the *number of different digits* : 0 is bit-reproducibility, 15 is totally different fields.

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ciboulette

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As output, it produces :

- for each job, a norms comparison file, where norms are compared **step by step** and **field by field**
- a *graphical summary* of all jobs, giving their worst norms comparison (among steps & fields)

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Tutorial		

Install helper for Mitraillette

add paths to checkpack/ciboulette toolbox (and vortex if not already in paths), into \$PYTHONPATH and \$PATH :

 \Rightarrow Cf. beaufix:~mary/public/mocuba/_install_bull

execute mitraillette install helper :

mitraillette_install.py
which will install to \$HOME/mitraillette
You can export MIT_INSTALL_DIR beforehand if you want to choose a
different directory.

- NB : since Karim Yessad left, one should take mitraillette from P.Saez : mitraillette_install.py --from /home/gmap/mrpm/saez/mitraille
- NB2 : Mitraillette is now maintained by H.Petithomme and P.Saez

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Tutorial		

Test my pack

- run a job on the pack I just compiled :
 - cd ~/pack/planet_object checkpack.py -c 46t1 -j mitraillette:L3_FCST_HYD_SL2_VFD_AROPHYSFEX_MAD _AROMALP1300

or

• checkpack.py -c 46t1 -j mit[...] -b ~/pack/planet_object/bin/MASTERODB

 to *list* the available jobs and job sets : checkpack.py --list_sets

- run all jobs, and compare to reference outputs (in P.Saez directory) : checkpack.py -c 46t1 -j mitraillette:all -r ~saez/cy46t1
- help : checkpack.py -h

(Re-)generate ciboulette summary

The ciboulette comparison is also useable on a set of jobs already executed, either natively using *Mitraillette* or with checkpack.

- any generated job can be modified and re-ran individually with sbatch
- **re-generate summary** for the bench mitraille_*nnnn* (implies to be in \$MIT_INSTALL_DIR) :

ciboulette.py cy46t1 ~saez/mitraille/cy46 -t mitraille_nnnn -i

• help : ciboulette.py -h

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- install mitraillette/checkpack/ciboulette
- make a pack on top of CY46T1
- 4 compile
- Some of the pack on jobset mitraillette:dev, compared to ~saez/mitraille/cy46t1 ⇒ cf. ciboulette output
- $\mathbf{0}$ assume α^2 was a bug, get back to α , recompile
- re-run the job alone
- re-build the ciboulette graphical output