



# WIP and open issues towards a release

(hoping I am not forgetting some...)

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# Older work

- *Merged [madgraph4gpu MR #643](#) (April) – cudacpp copyright, license, authors*
  - See the discussion at the [April 25 meeting](#)

# Recent work (1)

- *Merged [madgraph4gpu MR #654](#) (yesterday) – update upstream mg5amcnlo*
  - Olivier’s mg5amcnlo fix for vector.inc in symmetry.f (“launch” fails build, [#629](#))
  - My minor patches [mg5amcnlo #54](#) for vector.inc (add comments, improve consistency)
  - Olivier’s [mg5amcnlo@ef334c5](#) (fixing CKKW for Saptar’s CMS Drell-Yan, [#645](#))
  - Olivier’s [mg5amcnlo@6e74616](#) (“small change to the black box”)
- ***NB! not included here: Olivier’s [mg5amcnlo@0a1038d](#)***
  - from “select\_color(..., channel, ...)” to “select\_color(..., iconfig, ...)”
  - this causes ggttg tmad tests to fail (different LHE file from Fortran and cudacpp, [#655](#))

# Recent work (2)

- *Merged [madgraph4gpu MR #560](#) (today) – pp\_tttt, different nwf's in P1 directories*
  - Different nwf in the two P1 subdirectories gg\_tttt (nwf=13) and uu\_tttt (nwf=18)
    - number of wavefunctions = number of external plus internal particles
  - nwf was in the common src/mgOnGpuConfig.h, is now in P1-specific CPPProcess.cc
  - fixed at code generation level
- NB! Not included here: I have not added pp\_tttt to the madgraph4gpu repo (yet?)
  - Probably useful to have it there eventually as part of routine functional tests?

# Color-related open issues

- *@Olivier: do we need the “select\_color” channel vs iconfig upstream patch?*
  - see one of the previous slides
  - this causes ggtag tmad tests to fail (different LHE file from Fortran and cudacpp, [#655](#))
- *@Olivier: can you confirm the current coloramps.inc in Fortran is correct?*
  - a few changes over time, do we now have the right IDs for parton showers?
  - note, I create coloramps.h from coloramps.inc because from Python I get wrong results

# SM process-specific functional issues

- *WIP: #628, wrong type argument to unary minus in gg\_tllq (SM)*
  - FFV calls should not have “-COUP” parameters as COUP is a pointer not a value
    - discussed a solution with Olivier (disable an optimization, keep two arrays for +COUP and -COUP)
    - need to understand how to make the solution portable (disable the optimization only if needed)
  - also affects BSM processes like SUSY gg\_tt
- *#630, cross section from Fortran and cudacpp differs in gg\_ttq (SM)*
  - this is a process with two P1 directories (idea: will also try them separately one by one)

# BSM process-specific functional issues

- *#616, SMEFT HRDCOD=0 builds fail (BSM only supports HRDCOD=1 for now)*
  - high priority: this is one of Zenny’s (and Robert’s) main processes?
  - high priority: HRDCOD=0 builds should be our default for reweighting
  - the problem is writing the code to propagate the alphas-dependence of BSM couplings
- *#614, SMEFT HRDCOD=1 builds fail*
  - high priority: this is one of Zenny’s (and Robert’s) main processes?
  - NB: HRDCOD=1 is not our default for reweighting – but easier to fix than HRDCOD=0?
  - “minor” issues? assert not constexpr, a few couplings must be vectorized, etc...
- *#627, SUSY HRDCOD=1 builds fail because sin/cos/atan are not constexpr*
  - low priority: HRDCOD=0 builds should be our default for reweighting
- *#615, exotic SMEFT (EWdim6) code generation fails*
  - low priority? not the main focus for Zenny
  - the error is deep inside the Python code generation machinery

# Remove non-standard madevent features

- *#658, remove non-standard feature of the madevent application*
  - main example: remove two new input parameters in “madevent < input\_file”
    - example: environment variables, or (better) runcard file?
    - Stefan has been working on this in [madgraph4gpu MR #620](#)
  - also: clean up executable names for integration in refine.sh script
  - also: clarify how to build none/sse4/avx2/512y/512z executables/libraries...



# Cross check handling of parameters

- #660, *initial cleanup of parameters for the release*
  - just need to make sure that when eventually we “launch”, parameters are read ok...
  - maybe nothing to do, but I keep this as a reminder...

# Relocatable builds

- #613, *builds must be relocatable*
  - embed common random numbers in the process generated (WIP Zenny)
  - embed google test (or define an env variable to find it?)

# Port post-generation patches upstream

- [#656](#), *get rid of the patchMad.sh script*
  - remove patch.P1 and patch.common
  - generate coloramps.h directly rather than from coloramps.inc? (or do it in the plugin)

# Copy plugins to mg5amcnlo

- #661, *upload plugins to mg5amcnlo*
  - modify mg5amcnlo so that it knows where to find them
  - strip down and upload cudacpp and sycl to two separate repositories
    - as discussed at the meeting one month ago

# TEST the “launch” functionality

- [#659](#), *test the “launch” functionality for cudacpp (and sycl) code*
  - eventually: generate code via the fully integrated plugin and launch
    - our final, golden, integration test?
  - now: can already try with Stefan’s pre-cooked gridpacks?
    - see Stefan’s gridpacks from [madgraph4gpu MR #620](#)
    - for instance: can already try to assess if the numbers of events in each channel is adequate