PR and release status: makefile targets, BSM processes (EWdim6) etc

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(previous update was on May 14 – only mentioning changes since then)

Status update for my PRs – Makefiles

- Update on my PRs and issues (since May 14 meeting)
  - **MERGED: PR #798 (separate Makefile targets)** – two reviews by OM (thanks!)
    - This completely separates C++ and CUDA or HIP targets (extends/completes Jorgen's earlier PR)
    - NB: we now build EITHER "check.exe" OR "gcheck.exe" – we no longer build them together
      - "make BACKEND=cuda" and "make BACKEND=hip" build gcheck.exe
      - "make BACKEND=avx2" and other SIMD modes (none,sse4,512y,512z) build check.exe
    - NB: we no longer link together C++ and CUDA implementations of the same classes
      - Main example: runTest.exe EITHER tests C++ OR tests cuda
      - (But still keep separate namespaces, because it is cleaner, and in case one day we move to fat binaries...)
  - **MERGED: PR #841 (rename Makefile targets and variables)** – review by OM
    - This (hopefully!) rationalizes the naming conventions of build targets and internal makefile variables
    - *NB: we no longer build "check.exe" or "gcheck.exe" (or runTest.exe) – the names have changed*
      - *"make BACKEND=cuda" builds check_cuda.exe, runTest_cuda.exe, etc*
      - *"make BACKEND=hip" builds check_hip.exe, runTest_hip.exe, etc*
      - *"make BACKEND=avx2" (none,sse4,512y,512z) builds check_cpp.exe, runTest_cpp.exe, etc*
      - This is consistent with the naming convention for madevent_cuda, madevent_hip, madevent_cpp
      - (Note: I kept a single "_cpp" suffix, but if needed it is easy to switch to "_cppnone", "_cppavx2" etc...)
    - This is also true for intermediate .o objects, not only for the final .exe executables
      - CPPProcess.o becomes CPPProcess_(cpp|cuda|hip).o

- In my opinion this completes what we needed to change in Makefiles for the moment
  - NB: standalone builds are still functional and should remain so (POWHEG, reweighting...)
    - Cleanup in earlier PRs – cudacpp makefile can either be invoked standalone or from Fortran makefile

Updates and recap – BSM & other processes

- Brief update on my PRs (since May 14 meeting) – Beyond Standard Model models
  - **New WIP PR #847 (EWdim6)** – adds EWdim6 “u d~ > w+ z“ to the repo (Zenny’s process)
    - Verified that my earlier BSM patches for SUSY/EFT fix code generation for this too (#615 is fixed)
    - Code also builds ok, but HRDCOD=(0|1) builds give different results at runtime *(new issue #846)*

- Recap of pending process-specific issues (mainly BSM, but not only)
  - *SUSY: #825 (susy_gg_tt madevent tests – xsec mismatch Fortran vs cudacpp)*
  - *SUSY: #826 (susy_gg_t1t1 madevent tests – no xsec in cudacpp madevent)*
  - *HEFT: #833 (heft_gg_bb madevent tests – LHE mismatch Fortran vs cudacpp, FPTYPE=f)*
  - *EWdim6: #846 (ewdim6_ud_wz cudacpp tests – ME mismatch HRDCOD=0 vs HRDCOD=1)*
  - *SM: #806 (gq_ttq cudacpp tests – segmentation fault on AMD GPUs on LUMI)*
  - Anyone interested in taking a look? Otherwise we can fix these after the release?

AOB and some next steps

- More tests in the ‘launch’ interface, more tweaks in the runcards
  - Olivier’s PR #835 (default FPTYPE=m in runcard) has been merged
  - However, I would suggest adding also HELINL and HRDCOD to runcard (issue #700)
  - And then make the syntax more consistent (e.g. cudacpp_fptype, cudacpp_helinl, etc)
  - And more tests, tests, tests

- Next priority for me: git repos and transfer scripts
  - See also the discussion in issue #661 and in Olivier’s issue #815
  - There was some discussion at the general mg5amcnlo meeting about git subrepos
  - Keep the madgraph4gpu repo anyway (generated processes, older branche like Lugano, etc)

- When the above is done we can think of a release?
  - Wait for Stefan’s PR #830 on warps and channel ID arrays (issue #765) or not?
  - Nathan’s Intel GPU support in cudacpp (#805): maybe after the release?
  - (Aim for end June or beginning July – I am on holiday for the next 2-3 weeks)