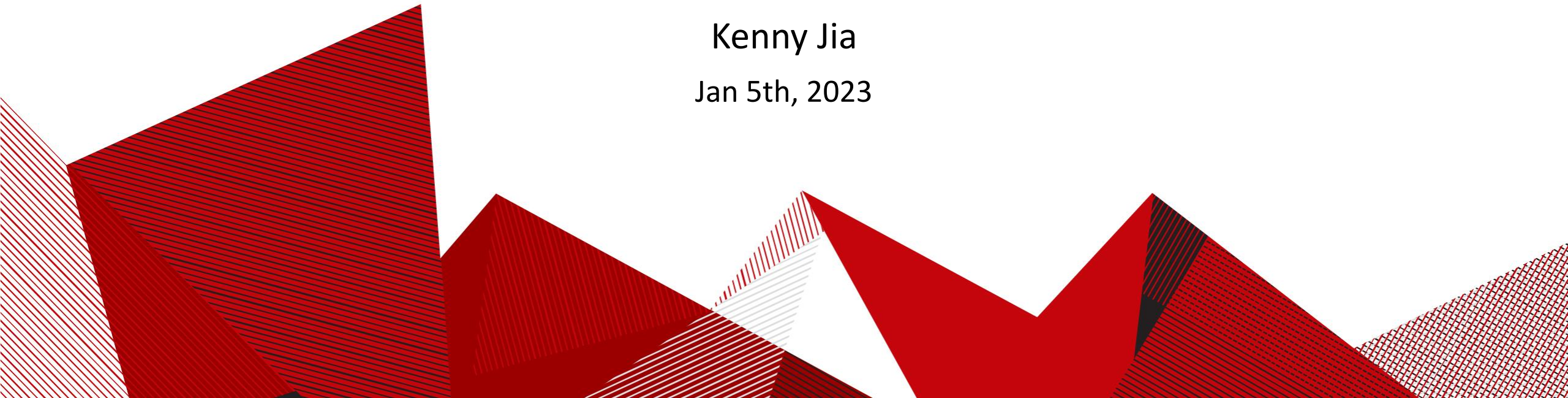




Measuring the Higgs Self-coupling Using the Muon Collider

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Running on login

- Test with 100 events, each event with 100 BIB particles(for time saving)
- Histograms: x, z_r, theta, phi, px_py_pz, pdgid_energy
- 2 Problems:
 - PDG ID
 - BIB Particle propagator



PDG ID

- PDG ID for each BIB particle is randomized by:
 - fPdgEnergyHist -> GetRandom2(pdgid, energy);
- GetRandom2 return Double_t rather than Int_t:
 - A list of “legal” PDG ID, find the closest one: electron, muon, photon, neutral pion, charged pion, proton, neutron (and their anti-particles).
 - Missing anything?



BIB Particle Propagator

```
** [-----] (0.00%)
counting334all particles
counting143stable particles
counting100BIB particles added

*** Break *** segmentation violation

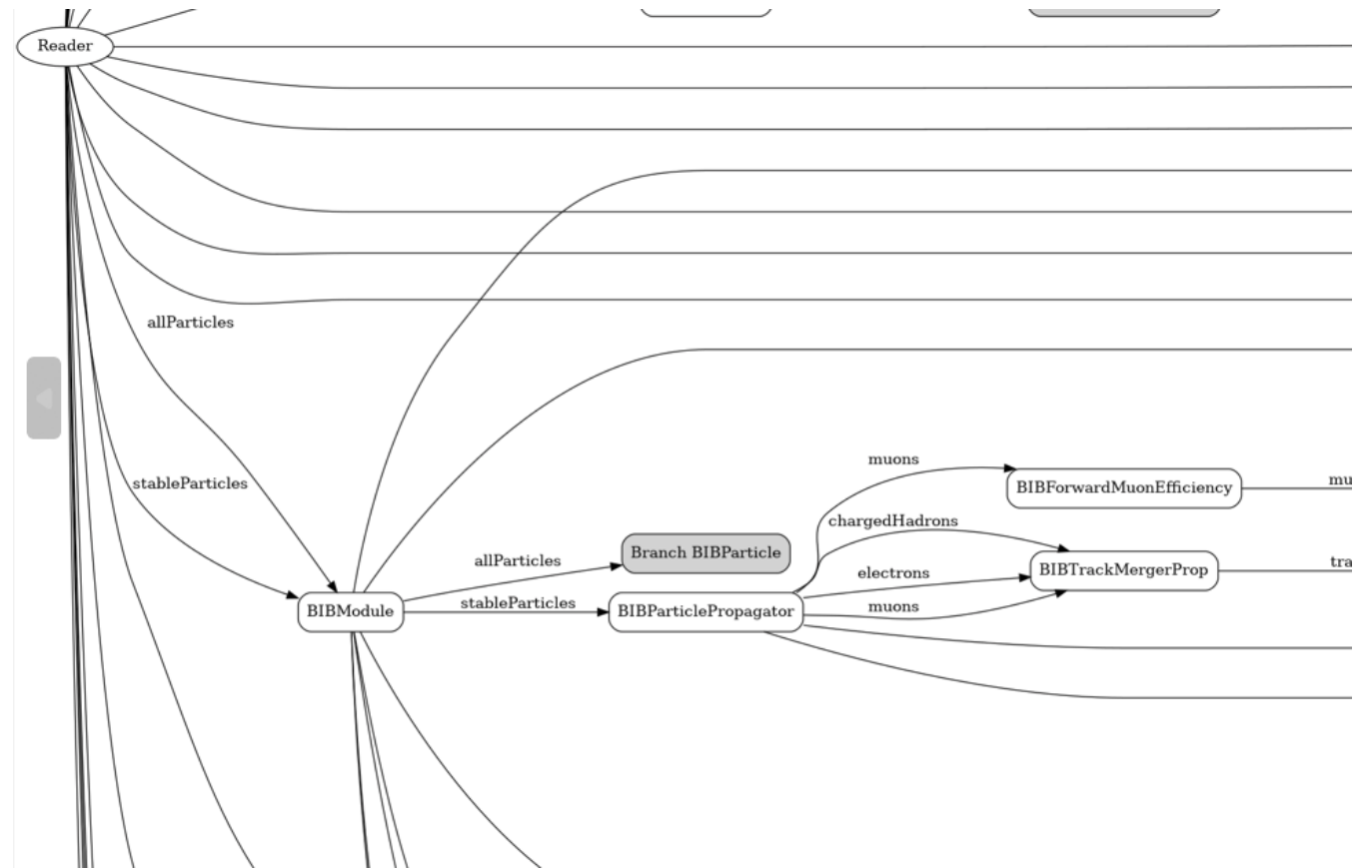
=====
There was a crash.
This is the entire stack trace of all threads:
=====
#0 0x00007f06cabcd60c in waitpid () from /lib64/libc.so.6
#1 0x00007f06cab4af62 in do_system () from /lib64/libc.so.6
#2 0x00007f06ccfe087c in TUnixSystem::StackTrace() () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#3 0x00007f06ccfdde85 in TUnixSystem::DispatchSignals(ESignals) () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#4 <signal handler called>
#5 0x0000000000530540 in DelphesFactory::New(TClass*) ()
#6 0x000000000052d530 in Candidate::GetCandidates() ()
#7 0x000000000005a64fa in ParticlePropagator::Process() ()
#8 0x00007f06ccf082af in TTask::ExecuteTasks(char const*) () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#9 0x00007f06ccf084d7 in TTask::ExecuteTask(char const*) () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#10 0x00000000004f783a in main ()
=====

The lines below might hint at the cause of the crash.
You may get help by asking at the ROOT forum https://root.cern.ch/forum
Only if you are really convinced it is a bug in ROOT then please submit a
report at https://root.cern.ch/bugs Please post the ENTIRE stack trace
from above as an attachment in addition to anything else
that might help us fixing this issue.
=====
#5 0x0000000000530540 in DelphesFactory::New(TClass*) ()
#6 0x000000000052d530 in Candidate::GetCandidates() ()
#7 0x000000000005a64fa in ParticlePropagator::Process() ()
#8 0x00007f06ccf082af in TTask::ExecuteTasks(char const*) () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#9 0x00007f06ccf084d7 in TTask::ExecuteTask(char const*) () from /cvmfs/sft.cern.ch/lcg/views/LCG_101/x86_64-centos7-gcc11-opt/lib/libCore.so
#10 0x00000000004f783a in main ()
=====
```



BIB Particle Propagator

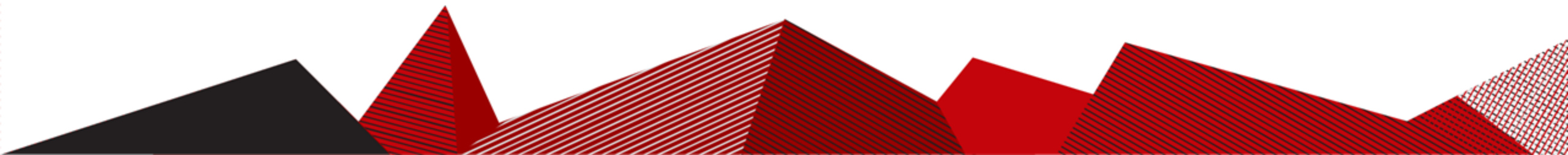
- I have to make the BIB Particle Propagator thinks BIB particle are from HepMC reader.





Next step:

- Study the ParticlePropagator
- Maybe more histograms needed.





- New Delphes card and BIBModule uploaded to github:
 - https://github.com/cvuosalo/MuonCollider/blob/main/runMGjobs/runMG_job/src/delphes_card_MuonColliderDet_HHstudy_BIB.tcl
 - https://github.com/cvuosalo/MuonCollider/blob/main/runMGjobs/runMG_job/src/BIBModule.cc
 - https://github.com/cvuosalo/MuonCollider/blob/main/runMGjobs/runMG_job/src/BIBModule.h
- Test with given histograms