MC Software Updates for rad-mu

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Chain for rad-mu without background

1. Madgraph for generation

2. EGS5 for passing through target

3. Add mother particles with truth information

4. target offsetting and beam rotation

5. SLIC for detector simulation

6. Spacing

7. readout

8. recon

Update for MadGraph

- In MG4/rad, particle ids for lepton pair are 611 and -611. To generate rad with mu+mu- trident, we just need to change such lepton mass as muon mass in parameter card.

- We have an issue to run MG4/rad since old fortran compiler f77 is set for compilation. *f77* exists at many places in the package. Through the command "*find madgraph4/src/RAD/MG_mini_Rad/apRad -exec sed -i 's/f77/gfortran/g' {} \;*", all *f77* are replaced by *gfortran*, and then the package works.

Updates for EGS5 and stdhep tool

- A EGS5 program *lhe_rad_mu.f* is built to process mu trident events with proper setup for building truth information of mother particles.

- The tool *add_mother_full_truth* is updated to be applicable for rad_mu events from EGS5.

Summary

- Information for rad-mu sample: https://confluence.slac.stanford.edu/display/hpsg/pass0+of+muon+trident+for+2019+MC

- In hps-mc, software updates and tests have been done. I am working on job system for rad-mu.