ePIC Software
ZDC ML Study@20241008

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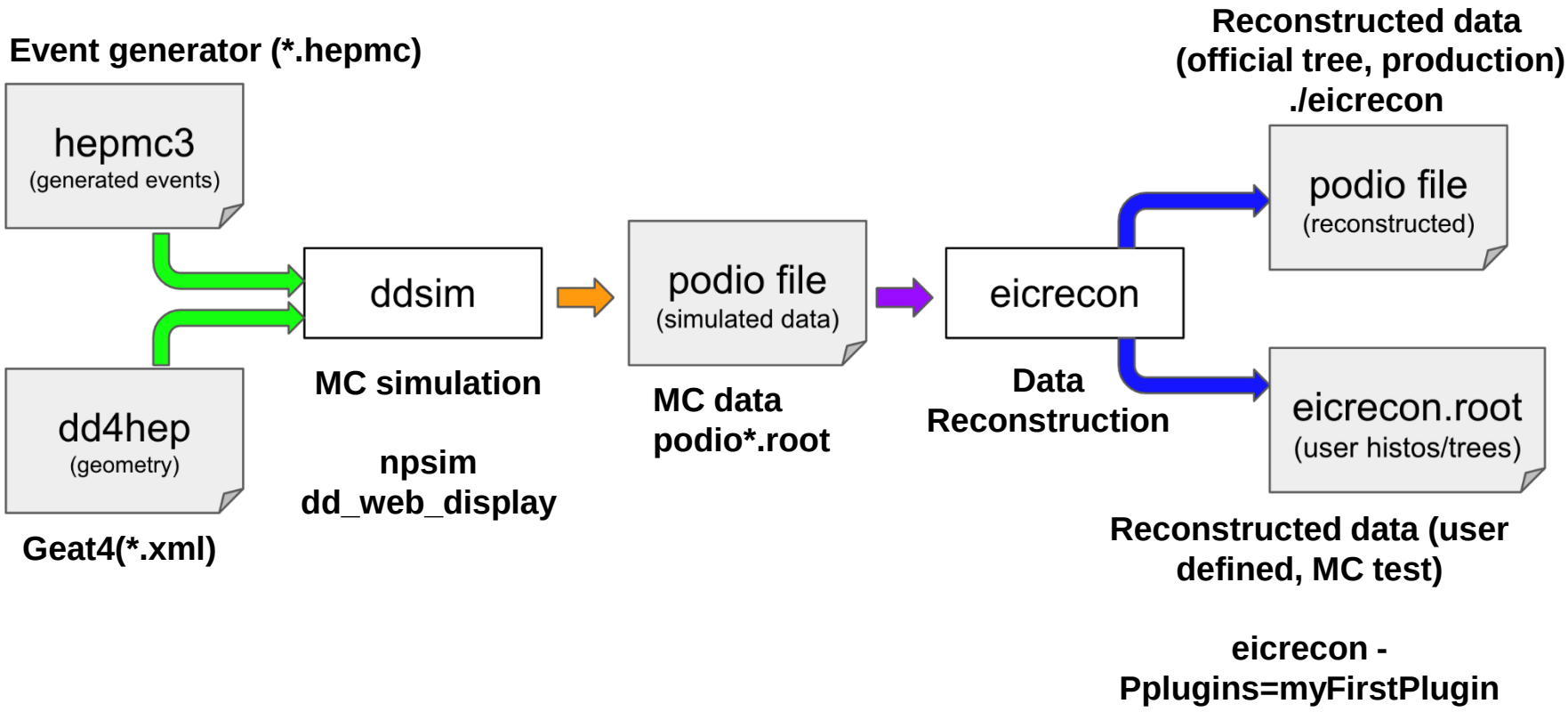
ePIC Software



- Install and run : ddsim, npsim, dd_web_display and eicrecon.

Tutorial

- Tutorial YouTube : https://www.youtube.com/watch?v=Y0Mg24XLomY&list=PLui8F4uNCFWm3M3g3LG2cOledhI7IvTAJ
- Two tutorials done on September, 2022 and April, 2024
- Some command lines/conditions introduced at 2022 might not work anymore. One should dig in the tutorial at 2024.
- Memo of the workshop on April, 2024 : https://eic.github.io/tutorial-analysis/01-introduction/index.html. One could copy the command lines directly.
- Note. Tutorial web : https://eic.github.io/documentation/tutorials.html
- Note. ePIC MC git : https://github.com/eic

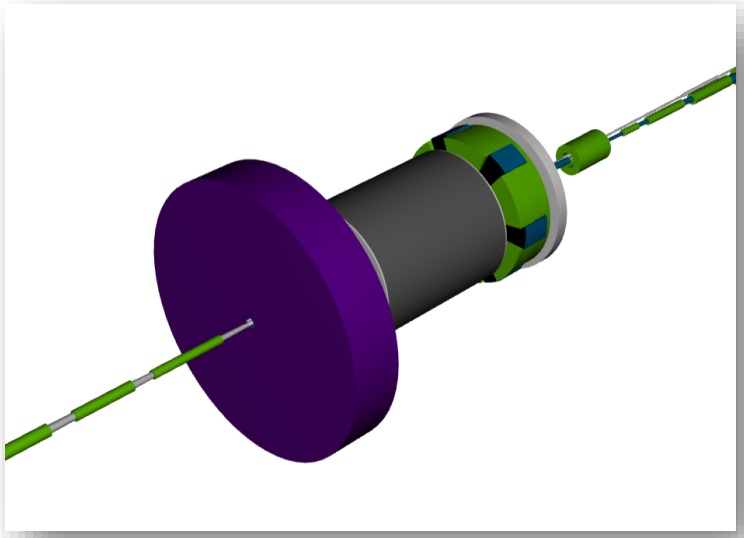
eic-shell

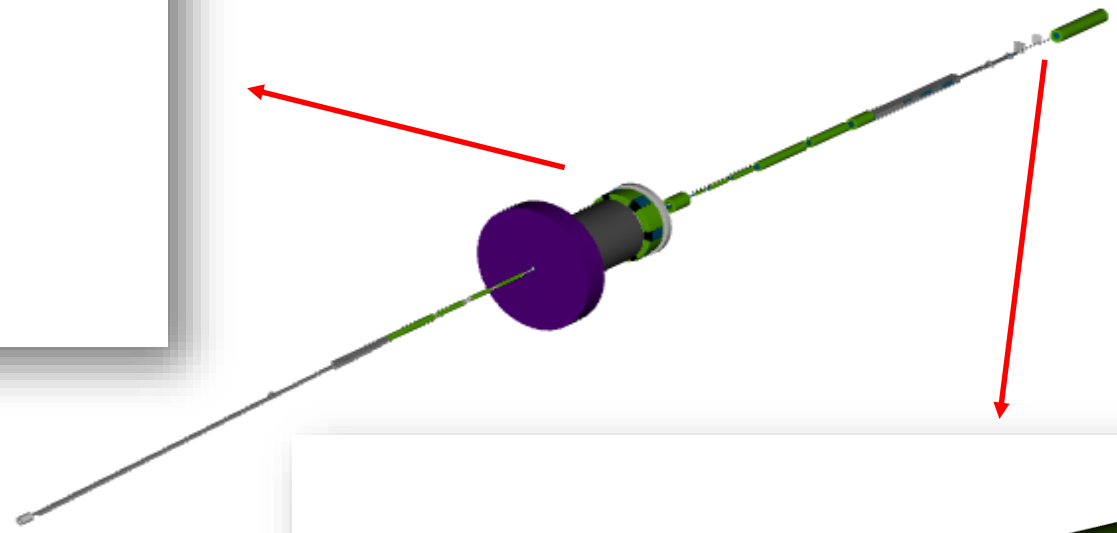
- ssh dyparton
- curl --location https://get.epic-eic.org | bash
- ./eic-shell
- #---------- under eic-shell ----------
- ls /usr/local/bin/singularity
- ls /opt/local/bin/ddsim
- ddsim #make sure to run ddsim
- root #make sure to run root

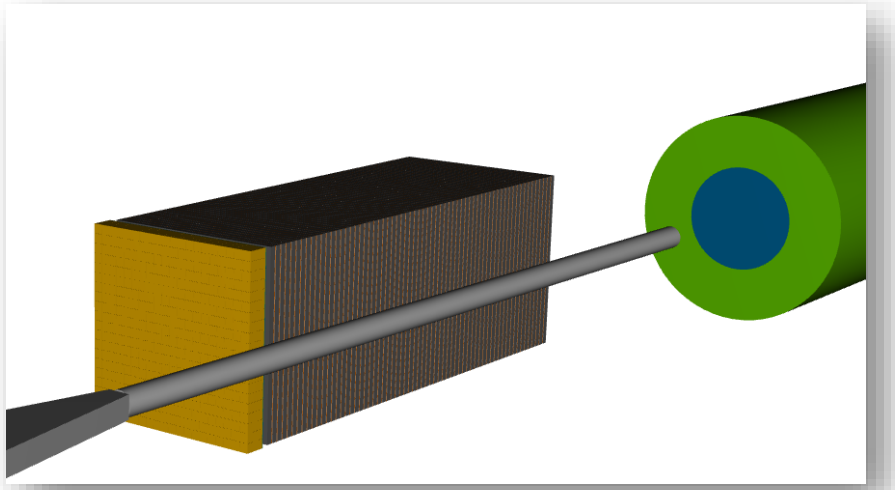
dd_web_display

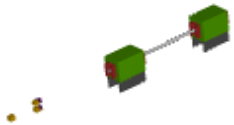
- #---------- under dyparton ----------
- #---------- under eic-shell ----------
- #- install epic master branch
- git clone https://github.com/eic/epic.git
- cd epic
- cmake -B build -S . -DCMAKE_INSTALL_PREFIX=install
- cmake --build build
- cmake --install build
- source install/bin/thisepic.sh
- env | grep $DETECTOR
- ls ${DETECTOR_PATH}
- cat ${DETECTOR_PATH}/epic.xml | grep
- cat ${DETECTOR_PATH}/compact/far_forward/ZDC_SiPMonTile.xml
- cat ${DETECTOR_PATH}/compact/far_forward/ZDC_Crystal_LYSO.xml
- dd_web_display --export -o geom_epic.root ${DETECTOR_PATH}/epic.xml
- dd_web_display --export -o geom_epic_ZDC.root ${DETECTOR_PATH}/epic_zdc_lyso_sipm.xml   #show ZDC only
- # go to https://eic.phy.anl.gov/geoviewer/index.htm?
- # upload geom_epic.root and check the geometry of detector setting

dd_web_display









ddsim

- #---------- under dyparton ----------
- #---------- under eic-shell ----------
- ddsim --help
- ddsim --dumpSteeringFile > steering.py # pilpe out the setting file to steering.py
- ddsim --steeringFile steering_min.py --compactFile $DETECTOR_PATH/$DETECTOR_CONFIG.xml -G -N 10 --gun.thetaMin "3*deg" --gun.thetaMax "45*deg" --gun.distribution "cos(theta)" --gun.momentumMin "1*GeV" --gun.momentumMax "10*GeV" --gun.particle "pi+“
- ddsim -N 100 \

--compactFile $DETECTOR_PATH/$DETECTOR_CONFIG.xml \

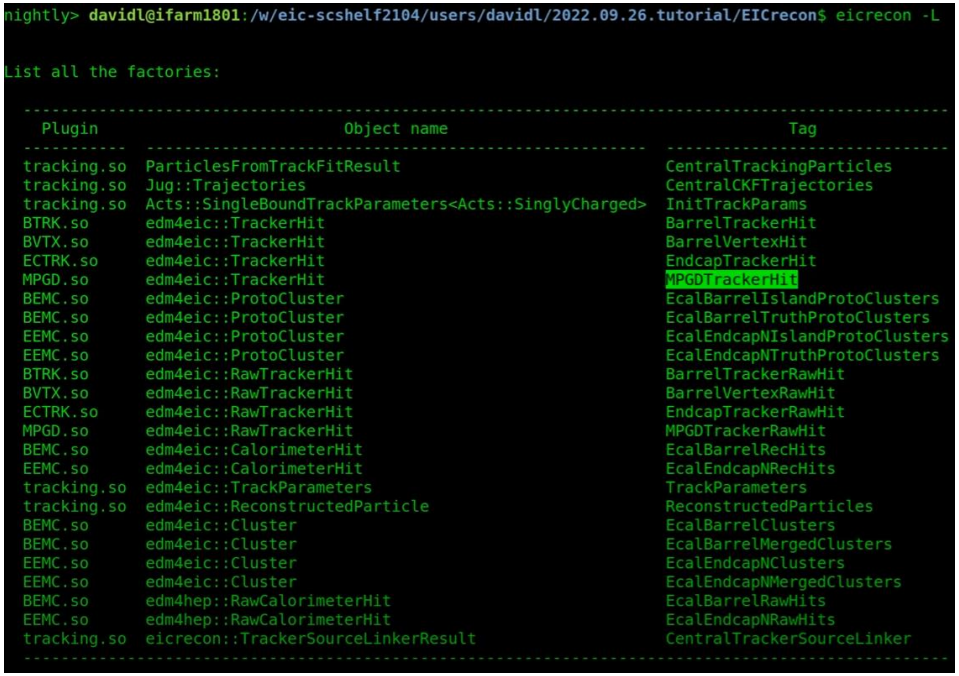
--outputFile out.root \

--inputFile **root://dtn-eic.jlab.org//work/eic2/EPIC/Tutorials/pythia8NCDIS_10x100_minQ2=1_beamEffects_xAngle=-0.025_hiDiv.hepmc3.tree.root**

- npsim #include default steering setting

eicrecon

- #---------- under dyparton ----------
- #---------- under eic-shell ----------
- git clone https://github.com/eic/EICrecn.git
- ./eic-shell
- cd ../EICrecon/
- cmake -B build -S . -DCMAKE_INSTALL_PREFIX=install
- cmake --build build
- cmake --install build
- source install/bin/eicrecon-this.sh
- eicrecon **-Ppodio:output_collections=ReconstructedParticles,Mcparticles MCdata**.root #assign the reconstruction algorithm one



eicrecon + eicmkpligin

- #---------- under dyparton ----------
- #---------- under eic-shell ----------
- eicmkplugin.py myFirstPlugin
- cd myFirstPlugin
- cmake -B build -S . -DCMAKE_INSTALL_PREFIX=install
- cmake --build build
- cmake --install build
- export JANA_PLUGIN_PATH="/usrX/cyhsieh/2024ZDC/eic/EICrecon/myFirstPlugin/install/lib:$JANA_PLUGIN_PATH“
- eicrecon --help
- emacs myFirstPlugin/myFirstPluginProcessor.h myFirstPlugin/myFirstPluginProcessor.cc
- cmake --build build
- cmake --install build
- eicrecon -Pplugins=myFirstPlugin MCdata.root

Status

- I have practiced full MC chain from Geat4 to reconstruction with official ePIC MC setting.
- Next step, I will try to include only ZDC and produced MCdata.root. Do we need reconstructed data?
- What kind of input file/beam condition should I assign?
- How do we share taskes?