# Genproc Meeting Notes

May 10th 2023

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Present : Igor, Marc, Anna, Dalila, Vladimir, Laurent D.

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Notes from previous meeting, 13th of March:

- https://docs.google.com/document/d/1mUVzXhhrez2EU7Mt1jivy-8V03PiDQyBut_GIQNVets/edit?usp=sharing

This meeting notes:

- https://docs.google.com/document/d/15alpv_MpmlBRjWPQ4Sjdu-s2iSOUDIh6CYZG_o7LHAs/edit?usp=sharing

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**Proposed discussion items / agenda:**

- Update on fast simulation
  - Anna
- Update on fast simulation tests inclusion in geant-val
  - Igor
  - Note from meeting with Dmitri and Lorenzo, 15th of March:
    - https://docs.google.com/document/d/1LVsBETyIaW3vCpusILC-falG0sY8Eg012RJ_CboAwtQ/edit?usp=sharing
- Related topics to inclusion in geant-val:
  - generic biasing
  - reverse Monte Carlo
  - geometry based importance biasing ?
- AOB
- Next meeting : end June ?

**Meeting notes:**

- Fast simulation:
  - Par04 example
    - inference on GPU using ONNX inference API
      - input to fast sim will be energy and angle
      - + set of random numbers
    - plan to integrate in the example
    - work with DESY group
      - under “AIDA-innova” project
        - fast sim task includes also Uni Manchester and David Rousseau
      - they are testing their GAN model using the same Par04-inspired Geant4 standalone application
    - CHEP (now)

                - EP-SFT fellow (Piyush Raikwar) is presenting the ML model
                - using the Par04 dataset to train it
                - other presentation on CaloChallenge
            - 30th-31st of May
                - workshop, indico page: https://agenda.infn.it/event/34036/abstracts/
                - 13 models will be presented (some tested on the Geant4 Par04 datasets)
            - MetaHEP
                - model adaptable:
                    - pre-training done for Par04 datasets, tuned to new datasets
                    - implemented for FCC (k4SimGeant4)
                    - interest of LHCb →going for implementation in Gaussino, first step of reproducing Par04 is completed
                    - Dalila taking care of ATLAS implementation
                - First phys letter B version submitted
                    - 1st review done, now responding to reviewer
- Gflash:
    - For example group
        - clang-tidy and clang-format  applied to example codes, Ivana is motivating this
            - essentially an automated
        - Igor is taking of this
        - basically ok with standard .clang-tydy from geant4 repository
            - but some problems appear with some (additional) options
        - done for gflash1,2,3 and a
- geant-val
    - started with gflasha test
    - geant-config-generator
        - python program allowing to generate config file job →create histogram to be published to the site
        - plots are added manually to the site by Dmitri
    - One example test produced
        - few things to fix
        - most complex is to write parser
        - now extract only two histograms per run
            - lateral and longitudinal shower profile
            - energy distribution will be added
    - Igor presents sample codes
    - technically not easy to display “text”
        - specially interesting for speed
        - but Anna tells that performances on Condors can be spoiled because machine are shared
        - Vladimir tells that a 20% fluctuation is “standard”
            - going below must be done with
- Discussion:
    - Laurent D. : reverse MC no progress for now, but interested in geant-val

        - nothing possible before mid-June
- AOB
    - Anna and Dalila will not join the CM
- Next meeting
    - End of June : ok