Status and Plan for BSM Physics Data Management
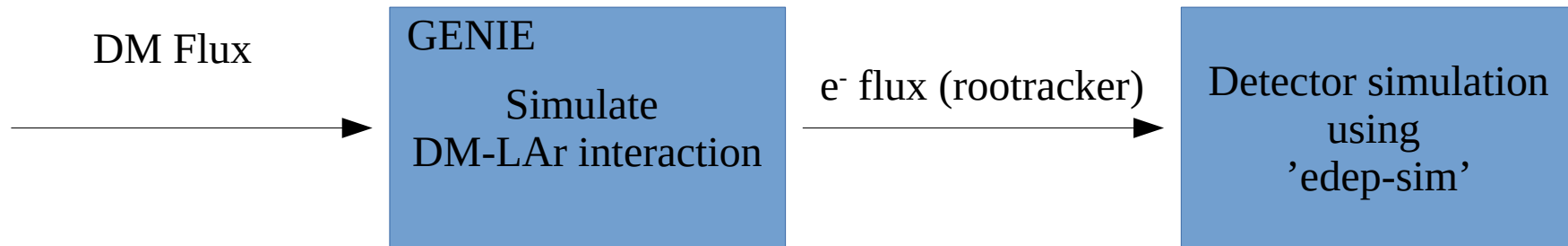
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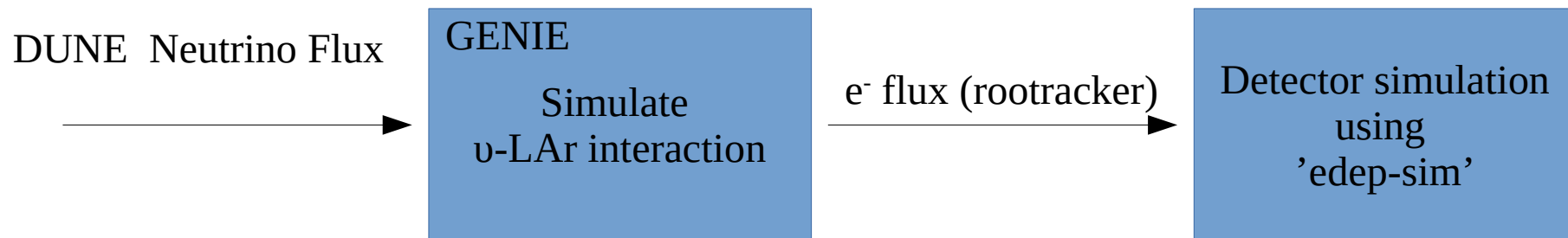
BSM Physics Data Management

- There are many different BSM physics topics:

  - Neutrino trident

  - Heavy Neutral Lepton (HNL)

  - Sterile Neutrino

  - LDM

  - Axion-like Particle (ALP)

  - … possibly more

- Many of these topics have similar analysis flow chains.

Analysis Flow (LDM Example)

Signal

DM Flux →

GENIE

Simulate
DM-LAr interaction

— e⁻ flux (rootracker) →

Detector simulation
using
'edep-sim'

Background

DUNE Neutrino Flux →

GENIE

Simulate
υ-LAr interaction

— e⁻ flux (rootracker) →

Detector simulation
using
'edep-sim'

LDM is something special case that signal and background analysis chains are looks very similar.

Signal characteristics may differ by analysis topics but background samples can be shared.

Pros/Cons

- If we share the background data throughout the different analysis topics,

    - it will be helpful for us to have some feelings about procedure each of analyses.

    - it will provide more efficiency of management

    - don't need to generate same background for different physics studies.

- Maybe there will be some worries about

    - losing flexibility of study

        - But I think this will NOT be a problem. We can always generate our own sample if we want to find out more suitable configuration of sample for our study.

        - If we found such a chance of improvement, one can always version up our data pool.

Vision

- So, what we need is not a huge and fancy database, but just a small and systematic management scheme.

- I can imagine important things at this point:

  - Common storage space (dunegpvm?)

  - Hierarchy of data (Naming scheme)

  - Version tracking/control (in a future?)

  - A website? Or documentation for instruction of data scheme.

  - … (Anything else?)

Plan

- So, I think it will be helpful for us to have a non-regular meeting to discuss about this.

- And I would like to know the names and email addresses of representatives from each of analysis groups who'll volunteer to speak for each groups in this meeting.

- Once the member recruitment is finished, I would like to survey suitable meeting schedule.