Status Report

GRAiNITA

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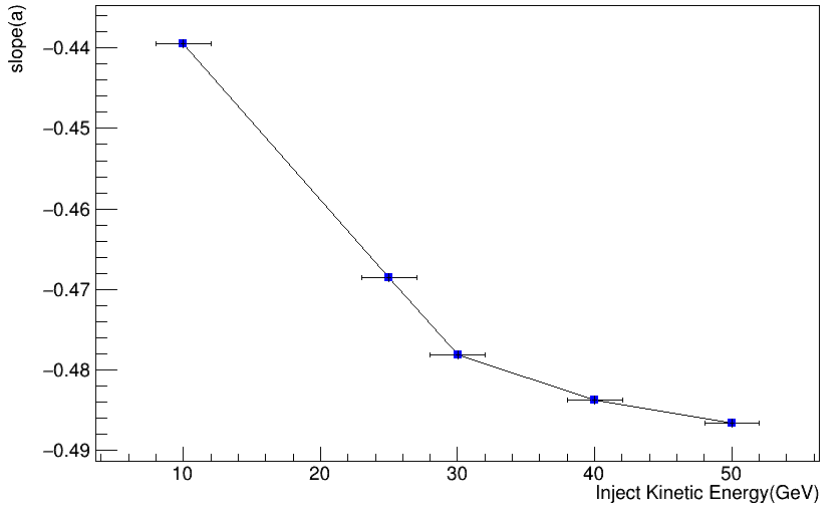
Status of PSD study

- Formalism
  - $E_{dep} = E_{offset} + aE_{had} = E_{em} + E_{had}$
  - $E_{had}^{0} = \min(E_{had})$
  - Rotating the raw $(E_{had}: E_{dep})$ based on (E_{had}^{0}, a)
- Simulation [w/o scintillation decay time constants in G4]
  - Geometry: simple crystal, ZnWO4/BGO
  - Energy vs crystal size vs particles
  - Toys: decay time + 10000PE/GeV

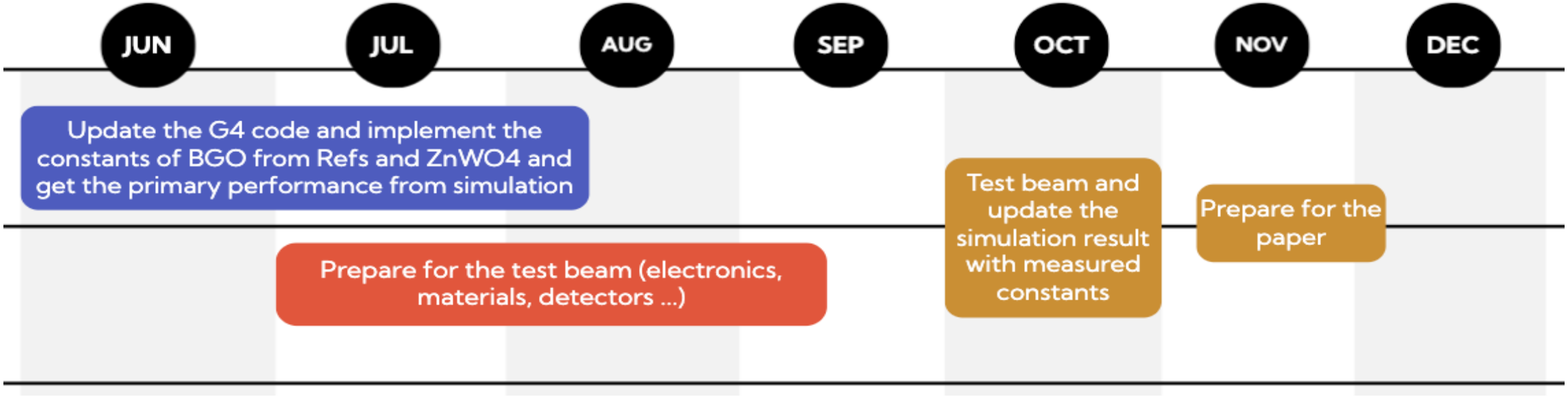
- Remaining problem:
  - The energy dependency of a
  - ➢ Possible solution:
    - ➢ Generate a (E, a) map
    - ➢ Decide the actual a in a iteration way



Status of PSD study (plans)

- Simulation [w/ scintillation decay time constants in G4, BGO/ZnWO4]
  - Crystal+fiber (initially implemented by Herve) or Crystal+siliconPM
  - Add decay time constants for materials(BGO/ZnWO4) & particles in G4
    - Numbers from refs (BGO) or estimation (ZnWO4)
  - Update the simulation with measured decay constants of ZnWO4 (BGO)
    - From test beam, low energy protons
  - Check the performance (σ_E, bias?...)
- Prospect and future plan
  - Beam test with prototypes to confirm the method and strategy in advance
  - Will not be included in the publication

Time line to reach the publication



- Rough plan for the simulation
  - ➢Get the performance result of BGO ~ Mid-July
  - ➢Add estimated constants of ZnWO4 and check the performance ~ Mid August