SiCalo Tracking meeting

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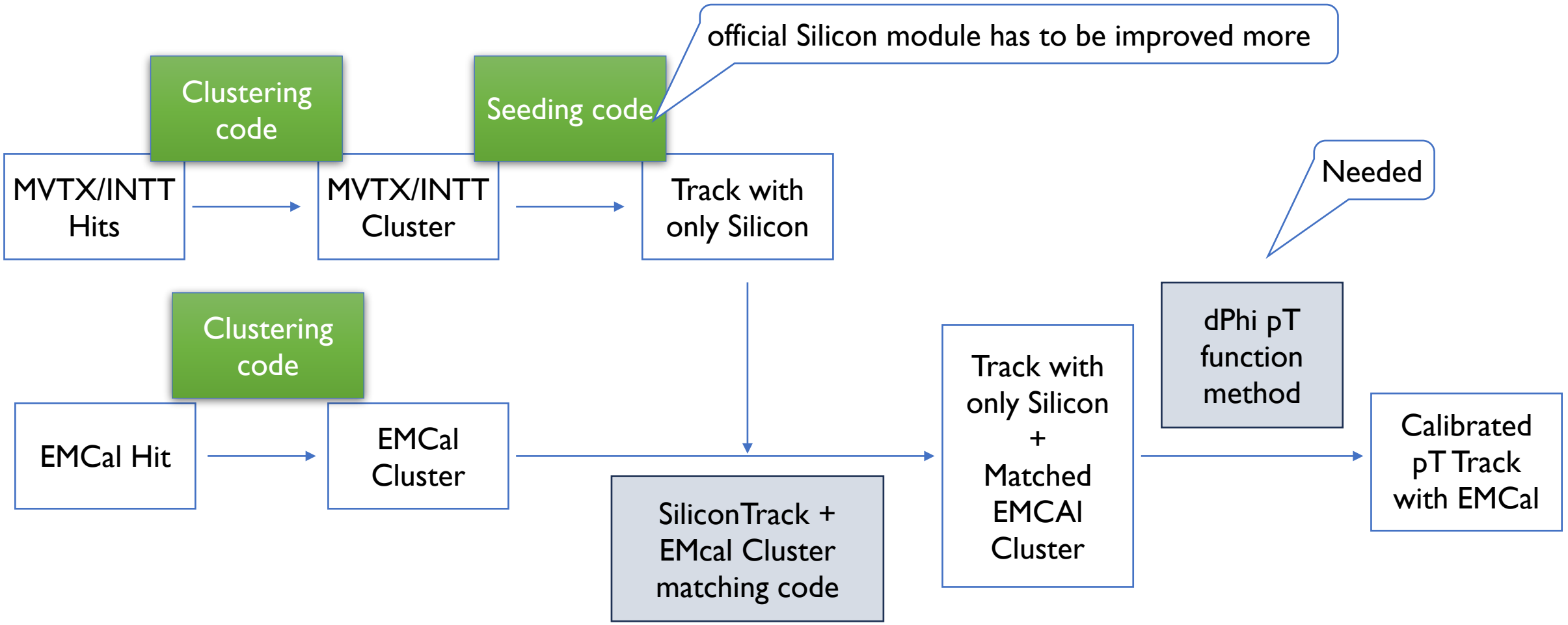
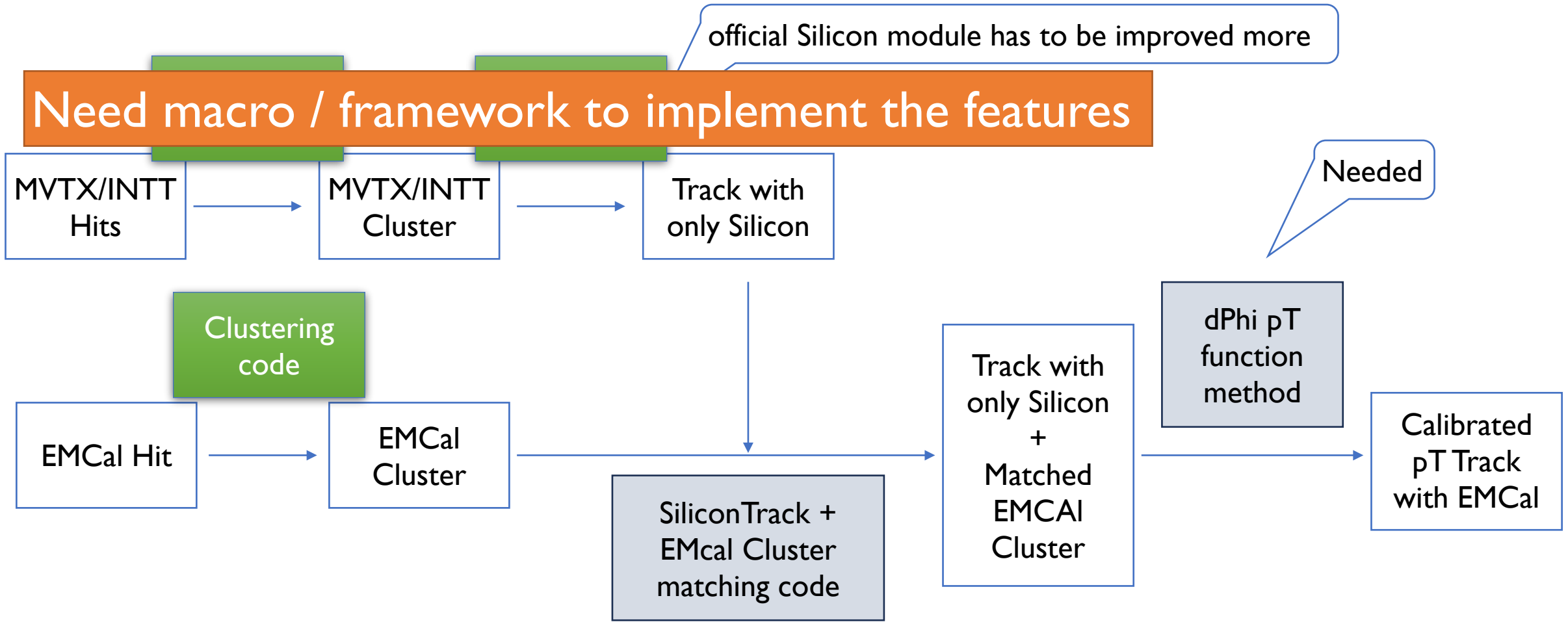
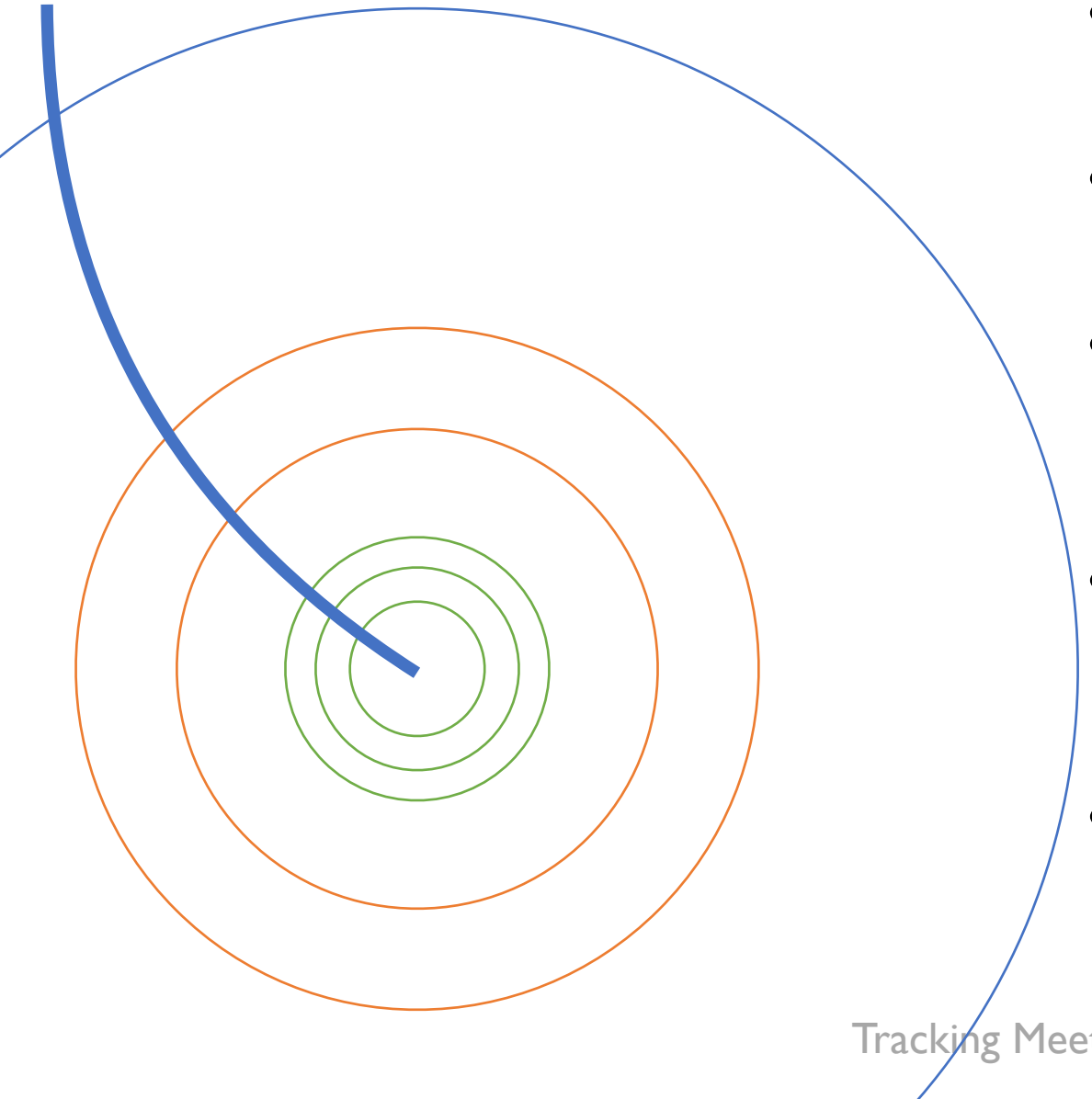
Recap


official Silicon module has to be improved more
Clustering code
Seeding code
MVTX/INTT Hits
MVTX/INTT Cluster
Track with only Silicon
Needed
Clustering code
EMCal Hit
EMCal Cluster
SiliconTrack + EMcal Cluster matching code
Track with only Silicon + Matched EMCAl Cluster
dPhi pT function method
Calibrated pT Track with EMCal

Macro / code updates



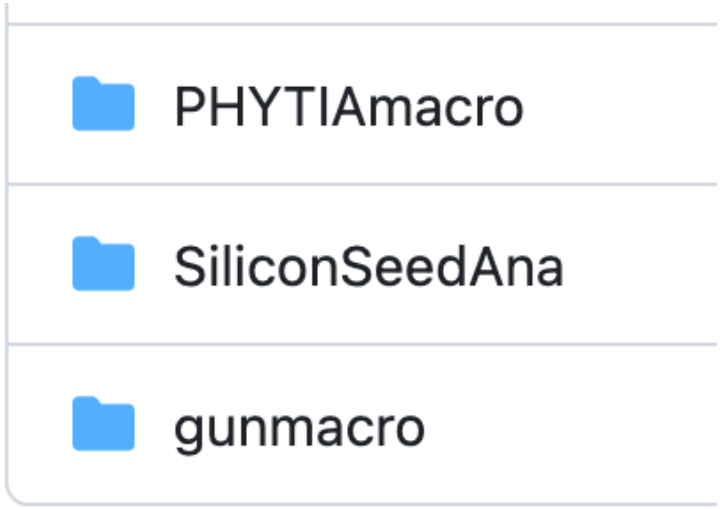
Track to EMCal Projection



- SvtxTrack class includes various kinematic variables
- Track->get_x() get_phi(), get_z()…. Default returns the track info at the R=0
- Need projection to EMCal surface and extract correct information for Si-Calo Matching
- Software is available (not easy to use unless you know how to use it..)
- Preparing macro so people can use it..

Code in Github

https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/SiliconSeeding



- PHYTHIAmacro

  Macro to run Track+EMCal in PHYTIA or DATA
  Importing two DSTs and dump into one TTree

- SiliconSeedAna

  Macro to run Track+EMCal with particle guns
  electron, pions, J/Psi…

- gunmacro

  Macro to run Track+EMCal with particle guns
  electron, pions, J/Psi…

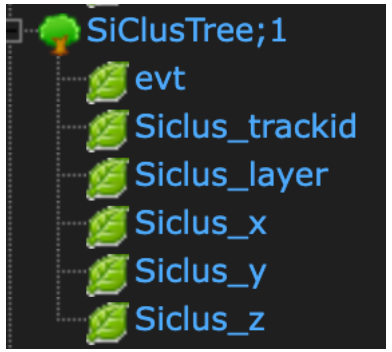
SiliconSeedAna Output information

https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/SiliconSeeding

Evt : event number
track id
(x,y,z) Eta,phi,pt at R=0
Track Chi2ndf
Charge(+ or -)

# of associated clusters
crossing info(for data)

(x_emc,y_emc,z_emc) position at R=93.5 cm
eta_emc phi_emc,
pt_emc at R=93.5 cm



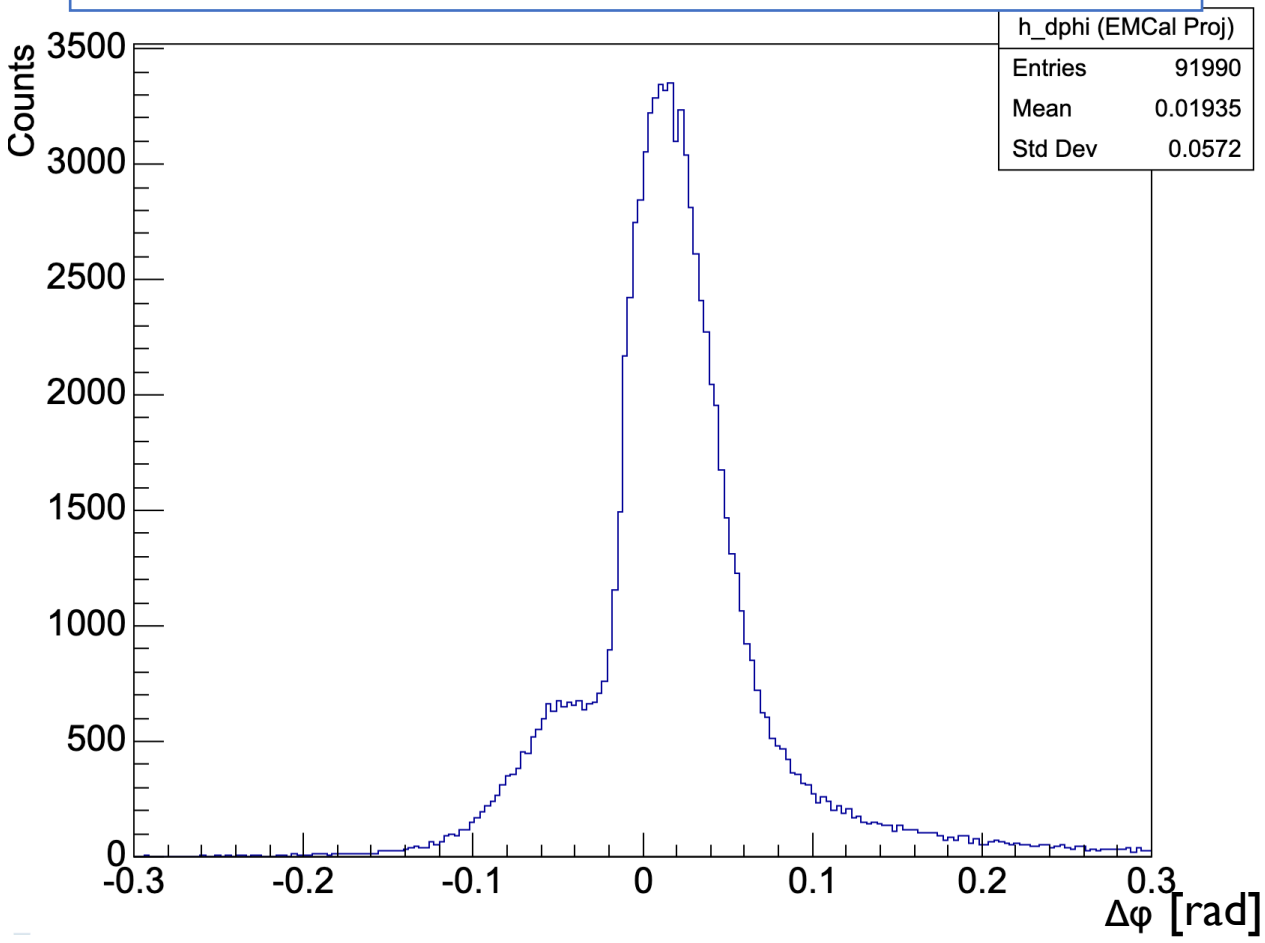
Track-associated Clusters information from Silicon
Note)We can use it for dphi - pT conversion

Calo cluster information (EMCal only)

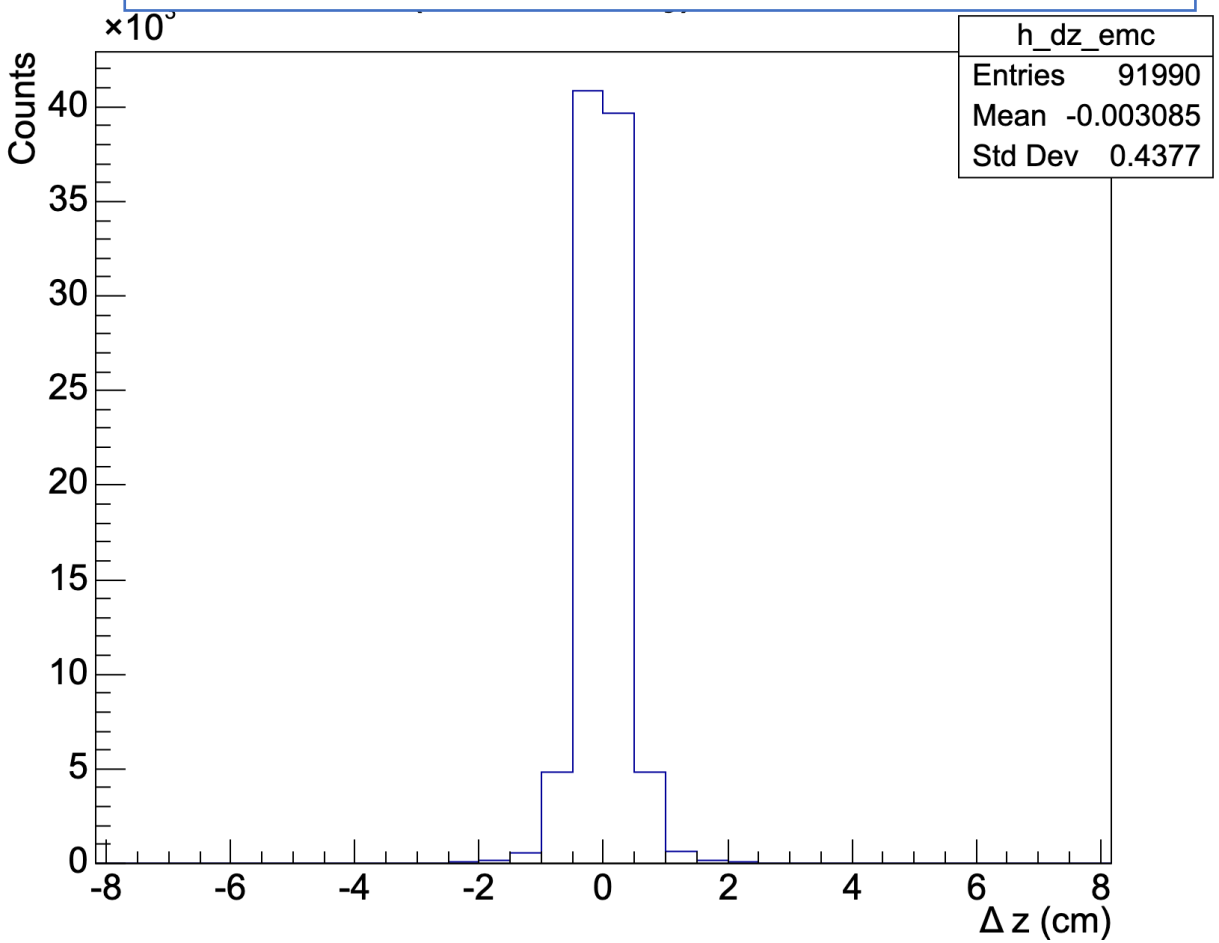
Projection test with electron gun

https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/SiliconSeeding

[Track phi at EMCal surface] - [Calo phi]

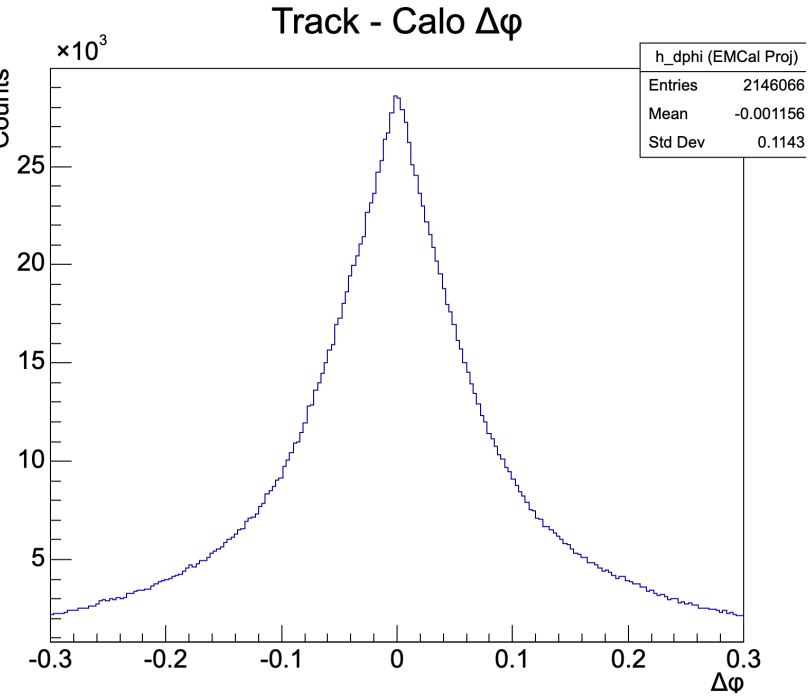


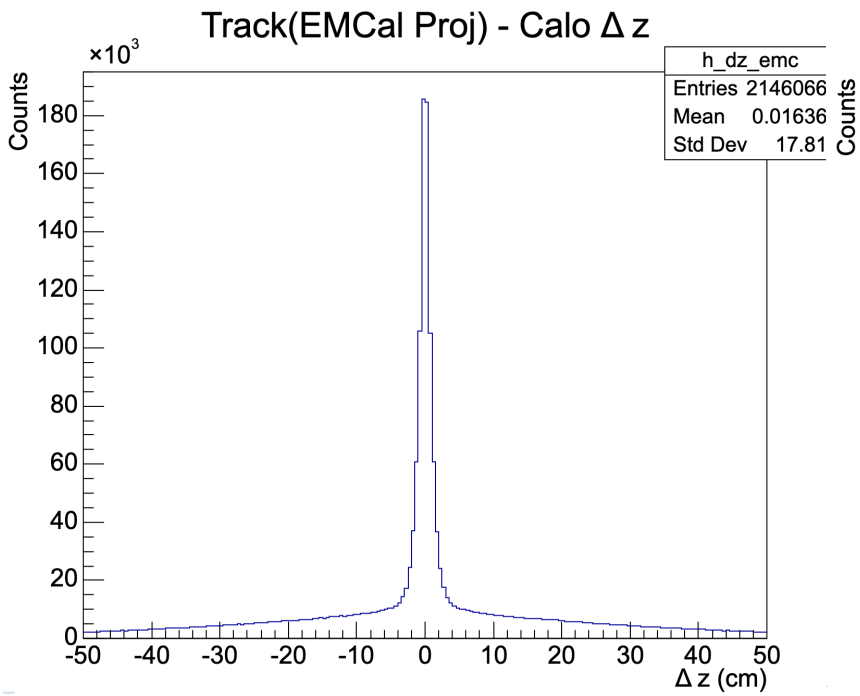
[Track z at EMCal surface] - [Calo z]

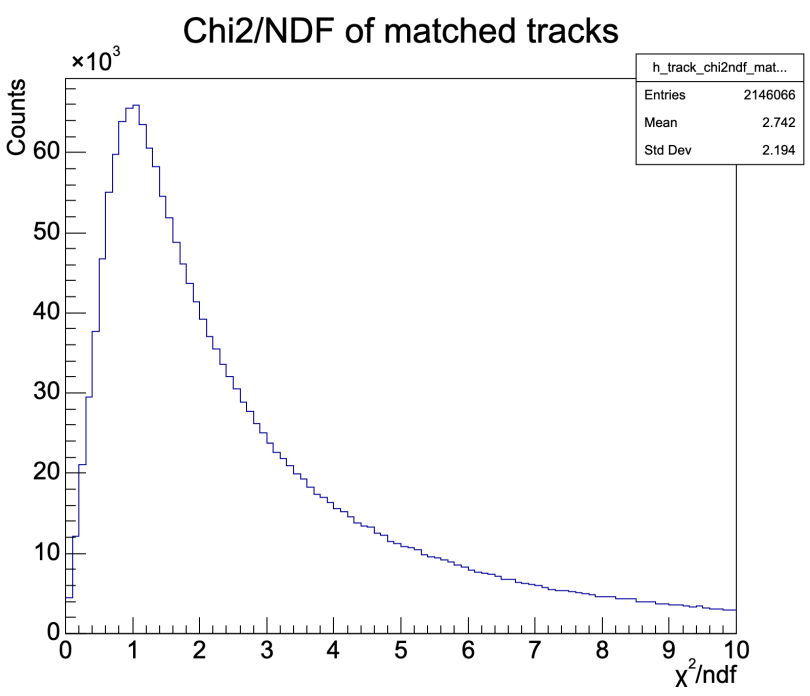


Trial for Si-Calo matching

Try to Si-Calo matching .. electron gun might not good enough..
Try J/ψ reconstruction with J/ψ gun! -> more than 1 track!
also Good test tool for E/p cut ; rejection for di-muon / harmonic decay







Trial for Si-Calo matching

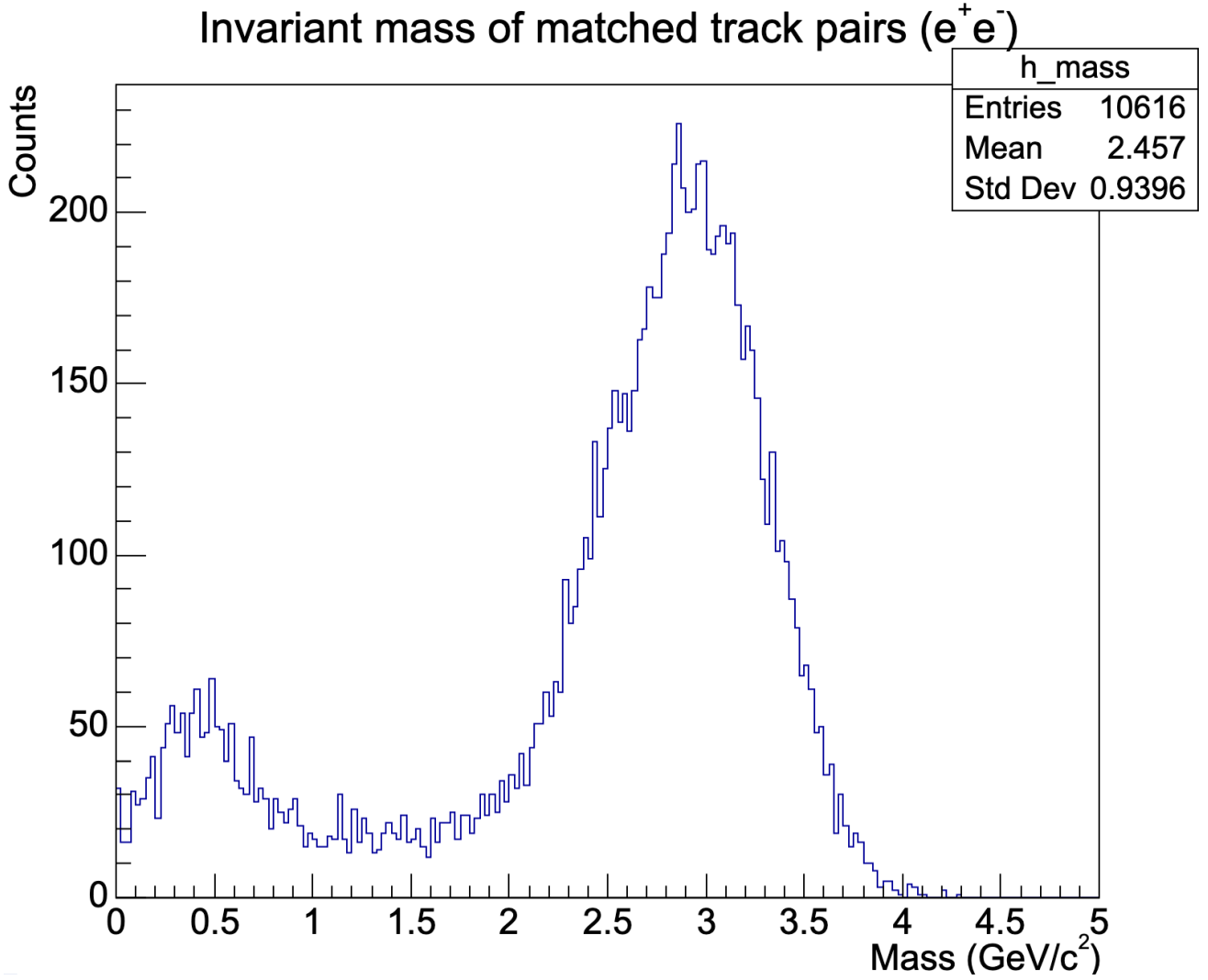
Basic Matching criteria

Minimum $\Delta R = \sqrt{(\Delta z)^2 + (\Delta \phi)^2}$

(Planning to change to $\Delta R = \sqrt{(\Delta \eta)^2 + (\Delta \phi)^2}$

Additional cut

0.8 < E/p <1.2
dz < 4 cm
pt > 0.5 GeV
nINTT > 1 && nMVTX > 2
Chi2/ndf < 4
opposite sign



THIS IS NOT Physics yet! Just for fun and testing the algorithm

Summary / Plan

I encourage people to try to use this framework! Not private KumaSeeding
At some point we must immigrate :)
https://github.com/gwd213/INTT/tree/main/general_codes/Jaein/SiliconSeeding/SiliconSeedAna

Preparing documentation(README.md) for any beginner who can use for running through (Ongoing)

Preparing additional framework to apply dphi-pT conversion (ongoing)