SiTrack + EMCAL Analysis w/ single J/psi / e- sim.

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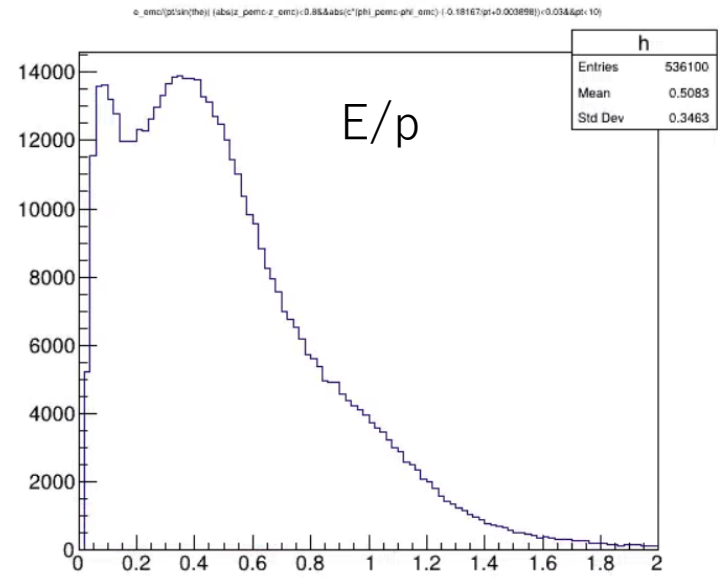
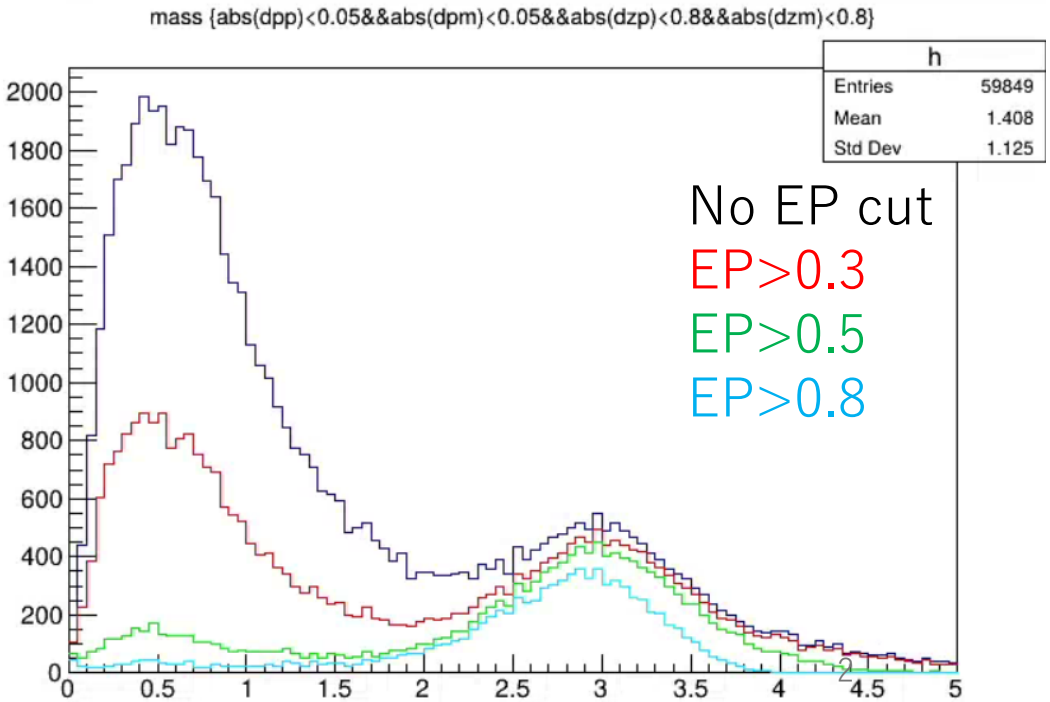
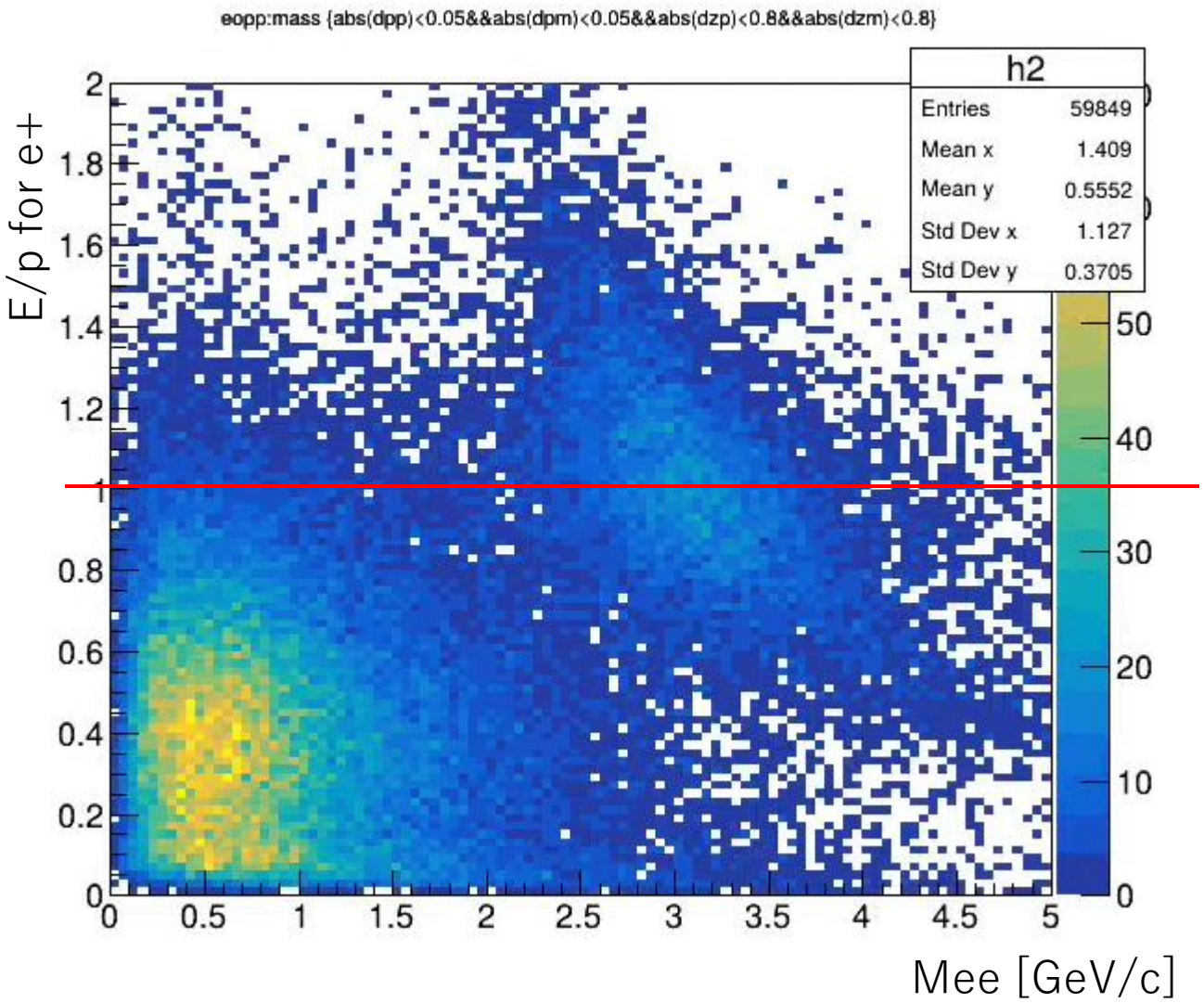
Recap

- Using Jaein's framework, the invariant mass of e+e- pairs is calculated
  - Single J/psi sim (all decay branchs included)
  - Mass at 3.1 GeV/c2
  - E/p < 1 (could be hadrons)
- Thanks Jaein, for studying the decay mode effect on Mass and E/p
  - E/p ~1 for e





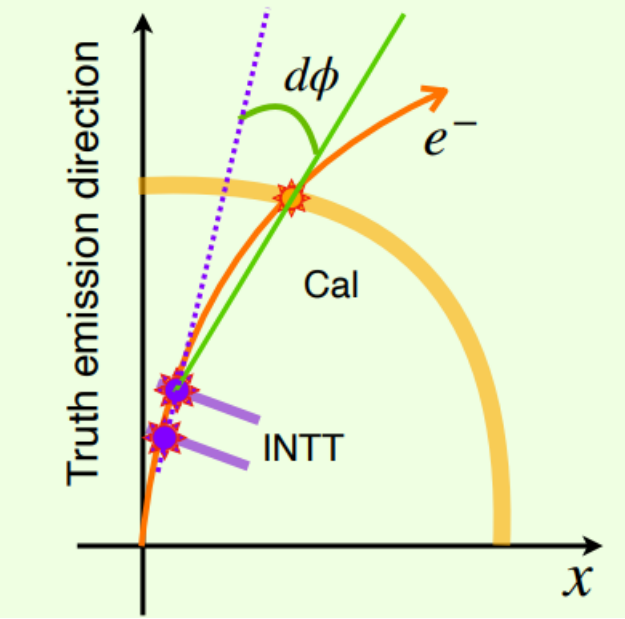
E/p for e+ vs Mass



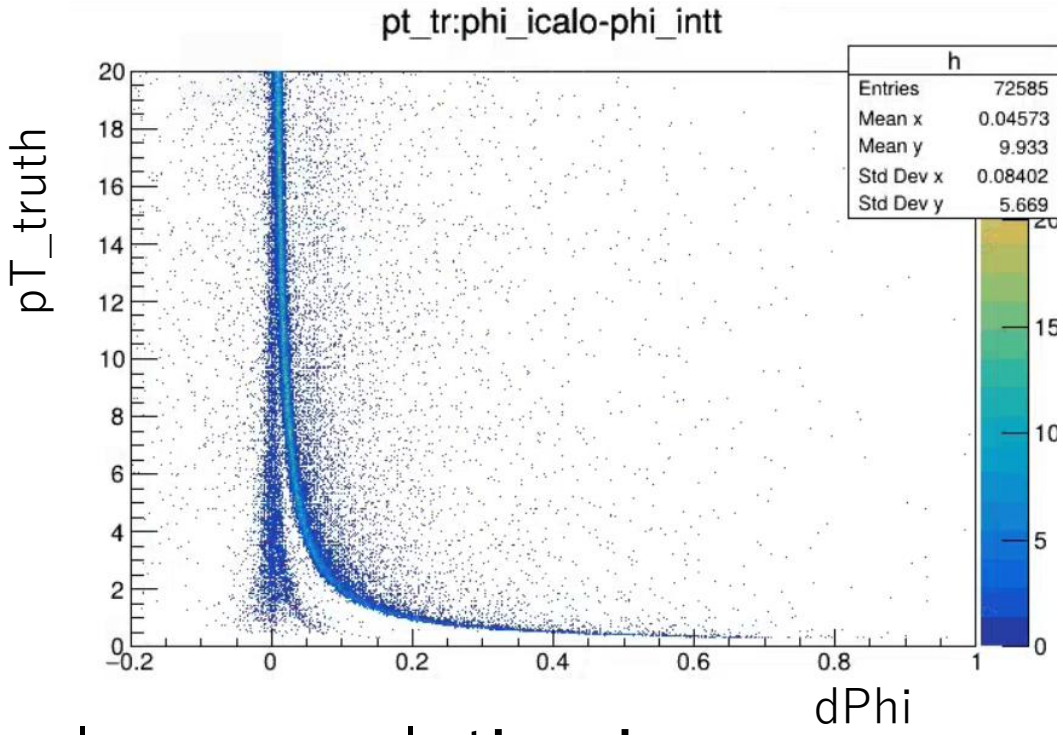
- Island at M=3GeV/c
  - Island is at E/p=1
  - M from electrons
- Interesting
  - Anti-correlation btw E/p vs mass because of mis-p calculation
    - Can improve if the p is corrected by EMCAL
  - E/p>0 (smaller Preco), M is smaller
  - E/p<0 (larger Preco), M is larger
- Improving momentum is desireble

pT improving method (Kuma method)

Vector1: INTT inner + outer clusters
Vector2: INTT outer cluster + EMCAL cluster
dPhi = angle btw Vector 1 and 2

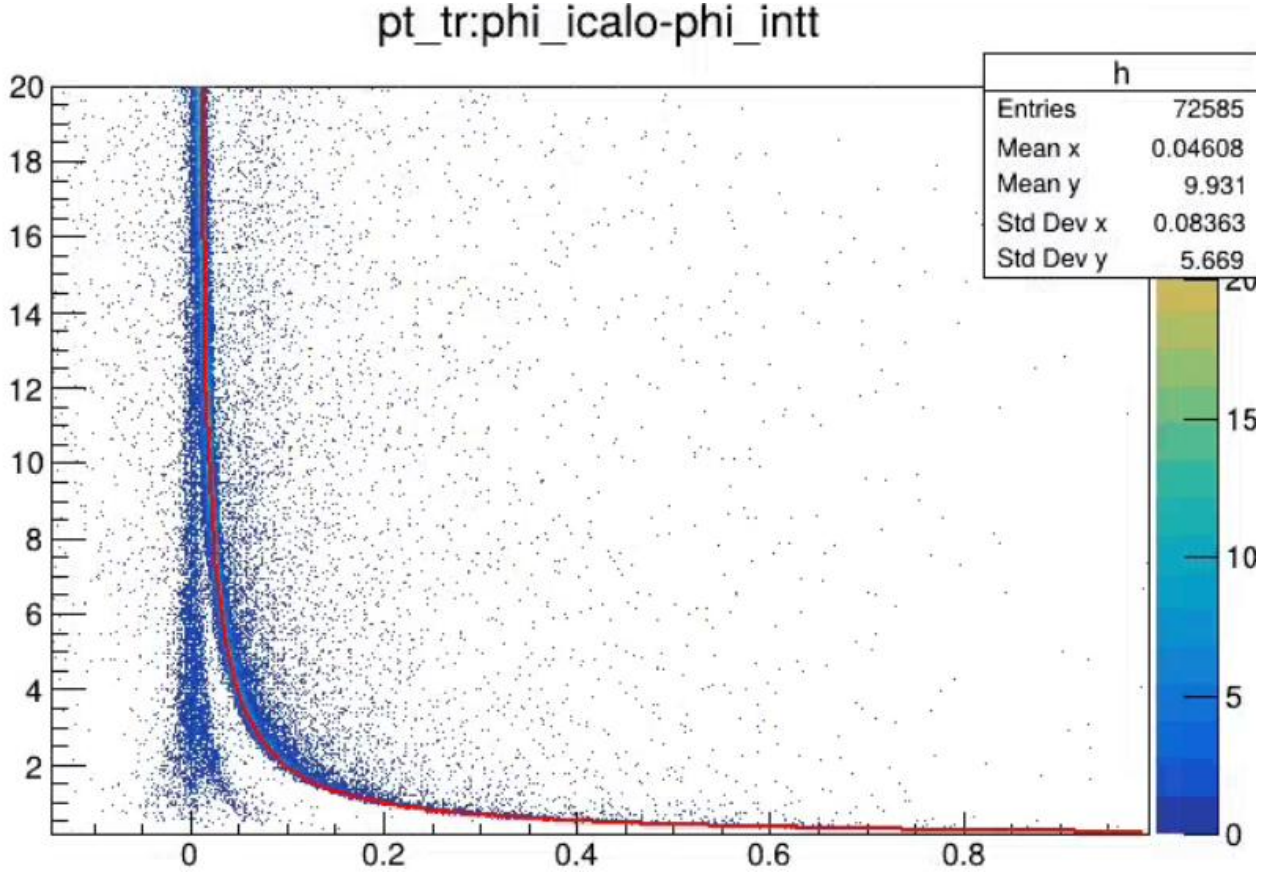


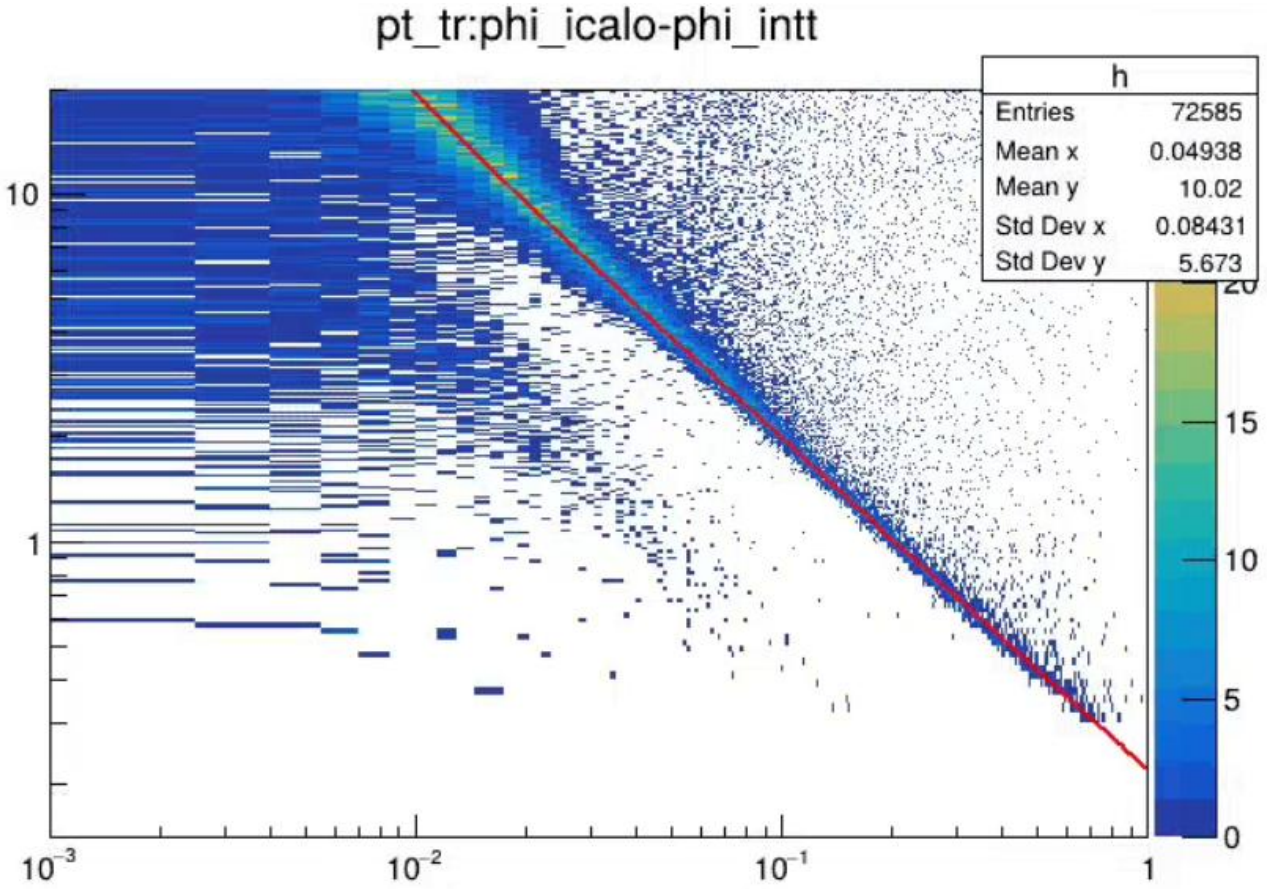
Single e- simulation (Thanks Mahiro and Jaein)



As Kuma reported before, a clear correlation is seen

Fit with a function

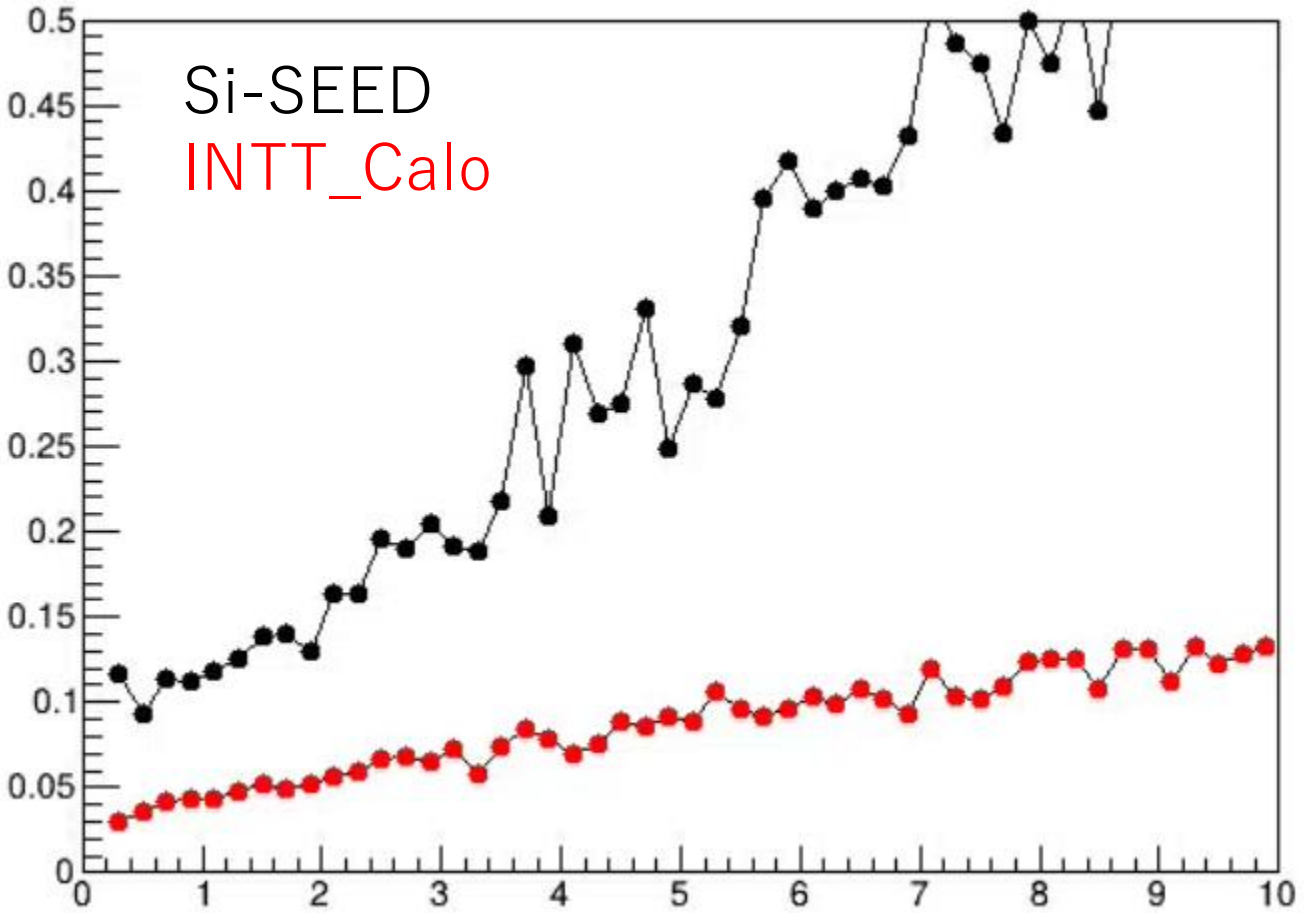




- Fit function : power law ([0]*x ^[1])
  - [0] = 0.21, [1]=-0.986, not fit but by eye
  - Data looks straight in log-log plots.

pT resolution

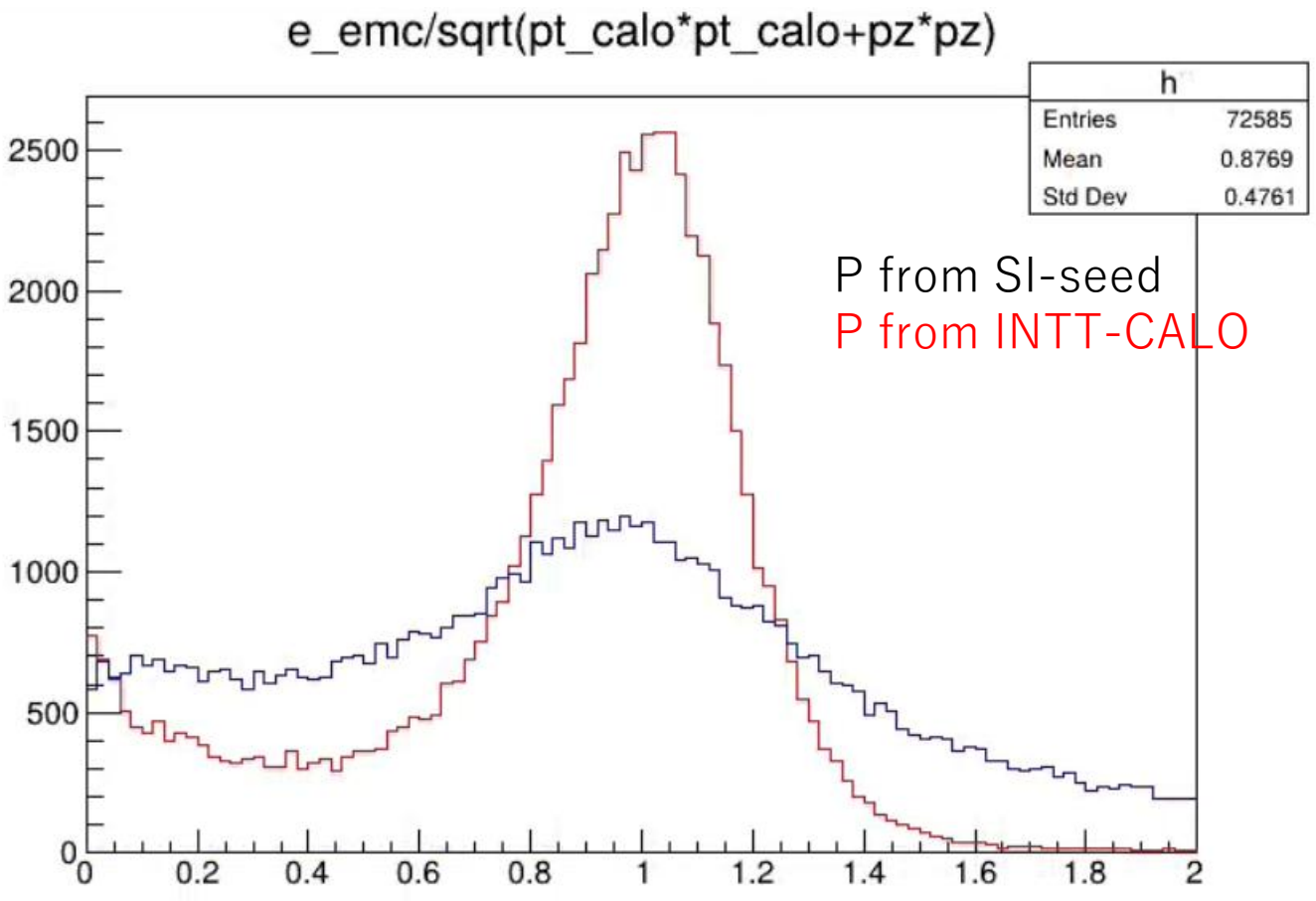
Reso =Width of $\frac{p_T - p_T^{tru}}{p_T^{tru}}$



- Si-Seed: 10% @ 1 GeV/c
- INTT-Calo: 4% @ 1GeV/c
- consistent w/ the previous studies (Hinako, Kuma)
- No eta dependence

- Jingyu and Genki are developing the better method. I would like to use it

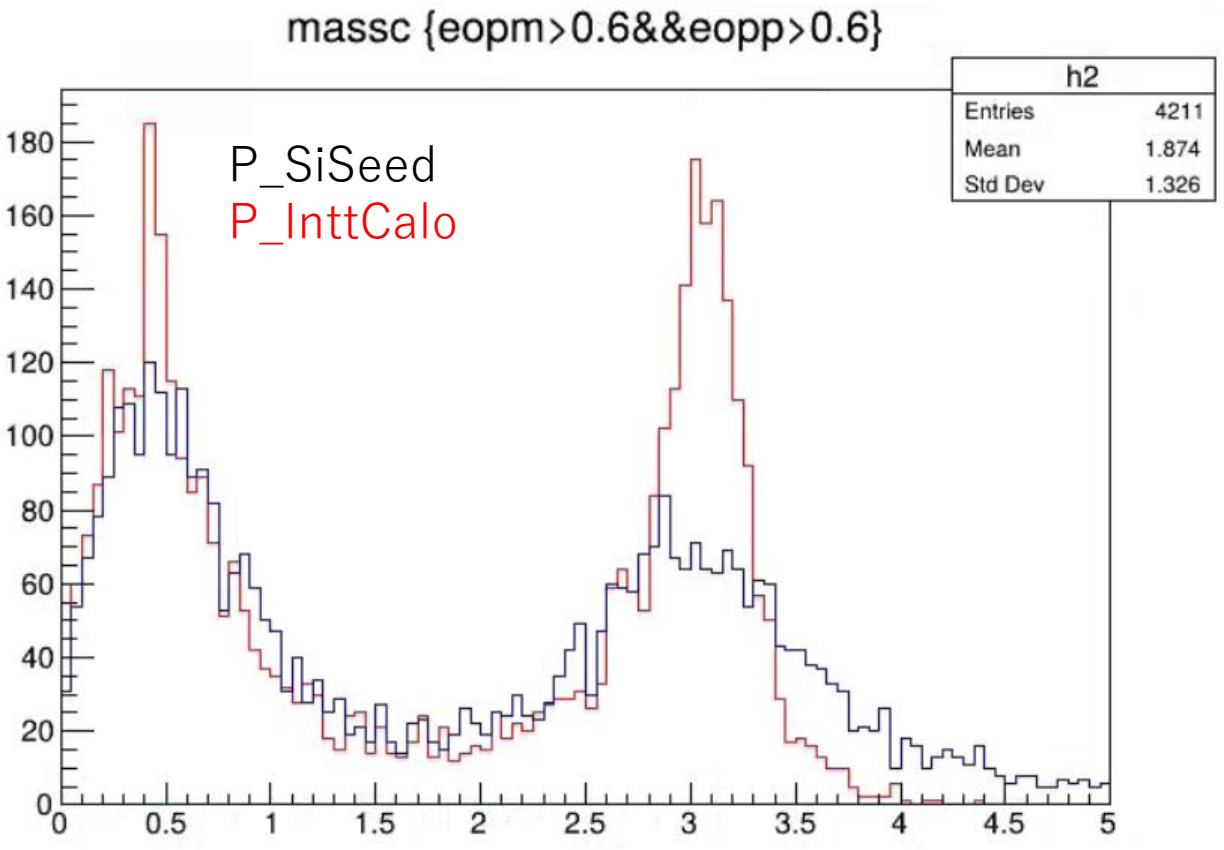
E/p



- E/p Peak become narrow using INTT-CALO pT
  - Pz for P is taken from Si-Seed
  - E/p is useful to check how the p is improved for both sim and data

- E/p > 0.6 is used for pair analysis

Invariant mass of e+e- mass



- Jpsi peak at 3.1 GeV bet narrower using INTT-Calo pT

Summary

- I played Jaein's code with Kuma pT method.
- E/p and J/psi mass peak get narrower
  - Single e- and J/psi (all decays) simulation are used
- Next step:
  - Analyze PYTHIA to see the background level
    - Mahiro is making the 1M PYTHIA events now
  - Use Jingyu's momentum method
  - See the p+p data