Few Preliminary Things about SCD in HerdSoftware

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A First Check

Common **HerdSoftware** installation on **CNAF**, under ams-accounts
→ minimize overhead of installing and updating multiple copies, and have unique production and analysis within the group.

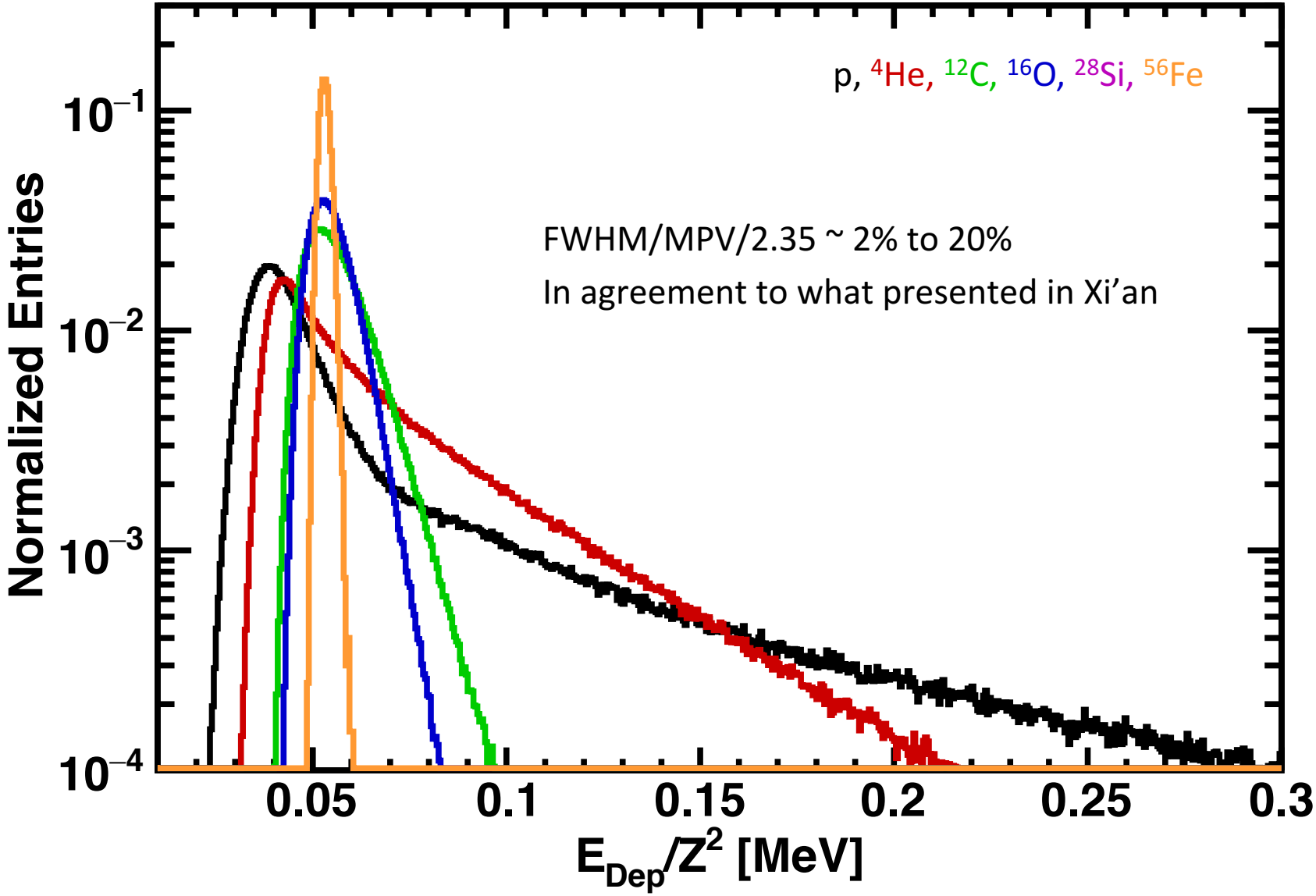
Using current default geometry SCD+PSD+FIT+Calo
→ SCD is made by **8 layers** of **150 µm** thickness (as proposed in Xi'an).

Similarly to what done for Xi'an, we are doing a test production of **10 GeV/n** energy particles **p, ^{4}He, ^{12}C, ^{16}O, ^{28}Si and ^{56}Fe**, in **–Z direction** generated from **(1,1,200) cm**. About ~ 1M events per element. Still running.

Store ParticleHits for SCD, and integrated hits for all detectors.
→ No use of digitization right now.

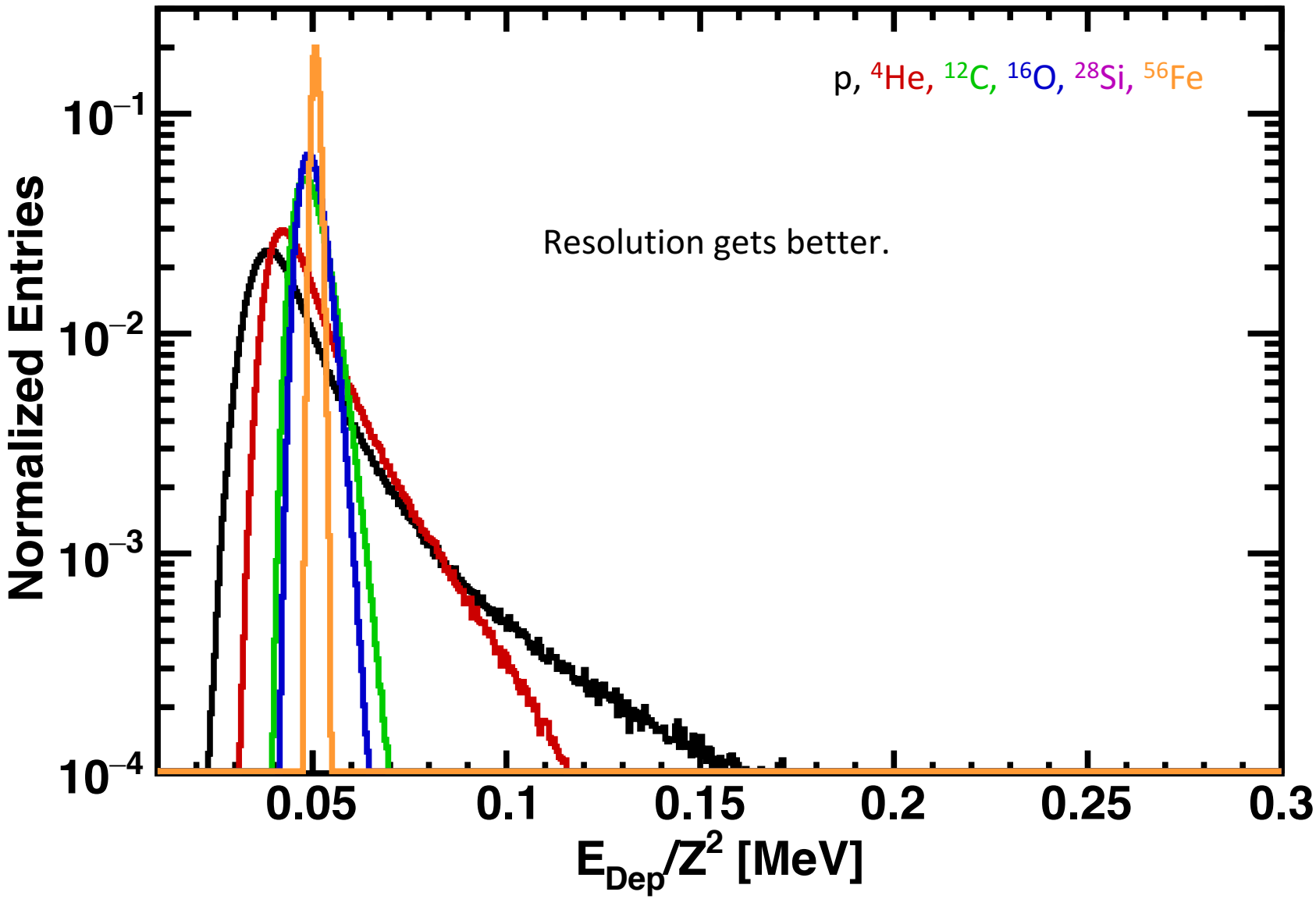
First Layer Energy Deposit: **Primary + δ-rays**

Continuous energy loss (primary) + δ-rays (production range 10 μm).



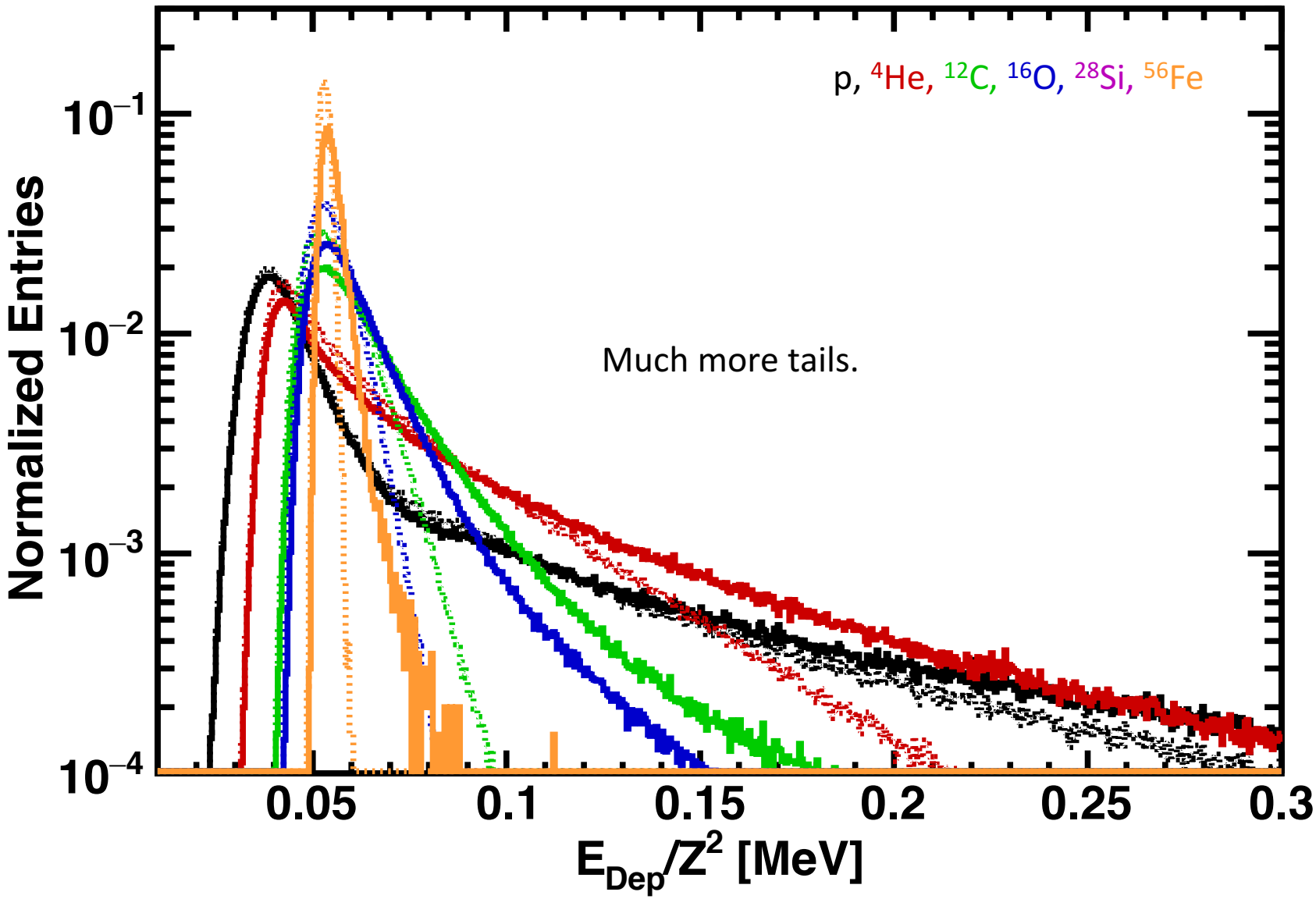
First Layer Energy Deposit: **Primary + δ-rays**

Restrict at 100 μm around primary.



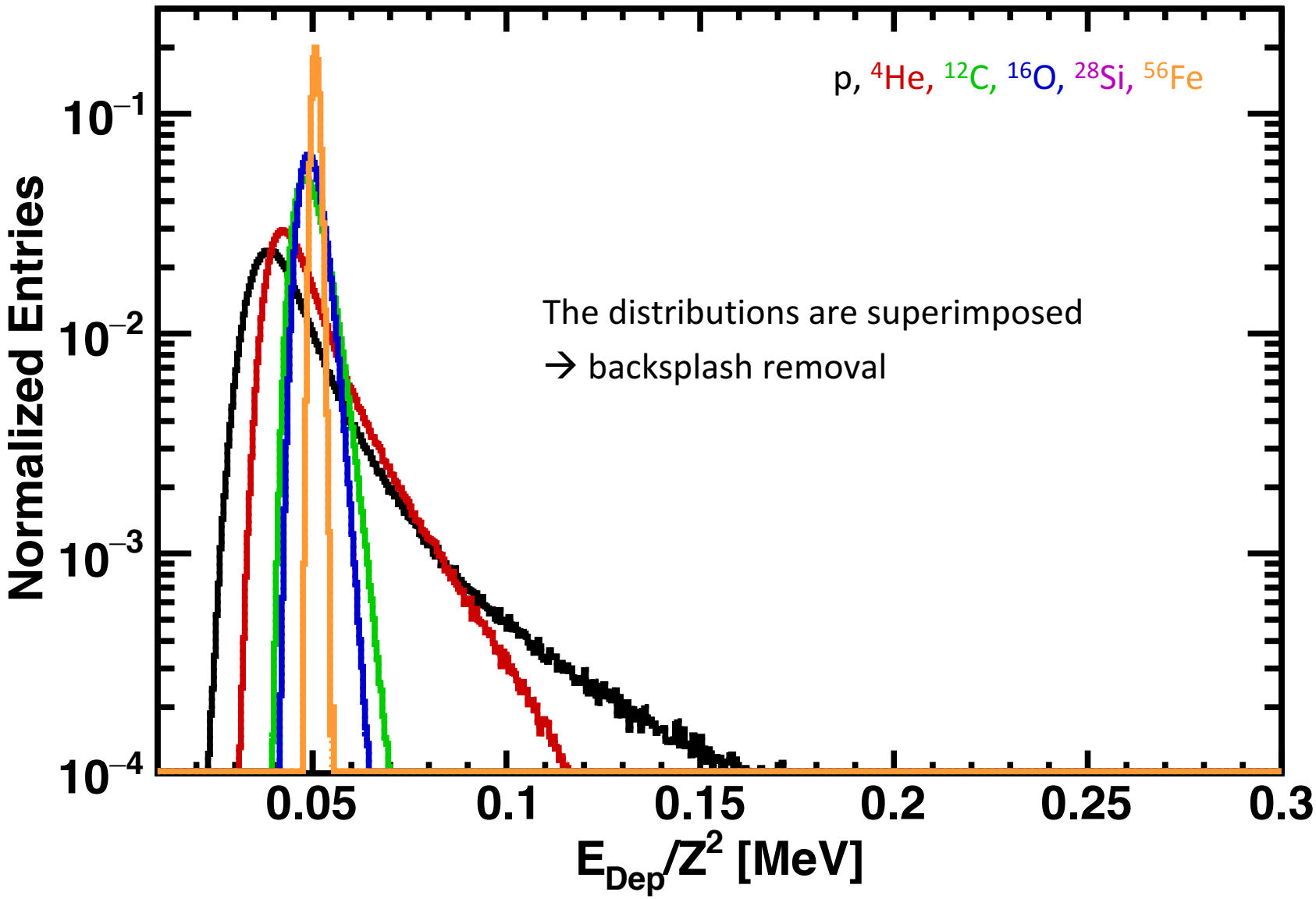
First Layer Energy Deposit: **Overall**

No interactions from above, only backsplash here.



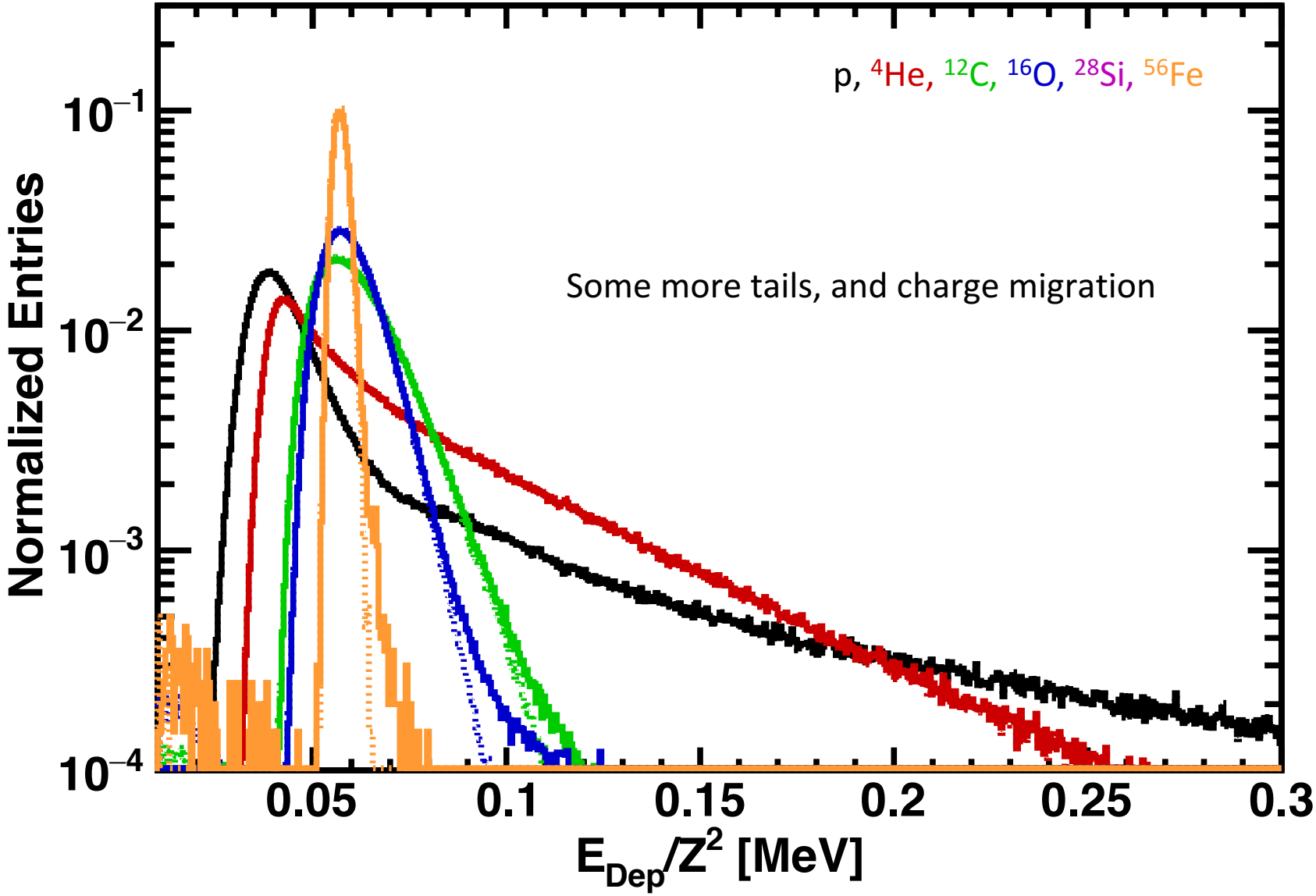
First Layer Energy Deposit: **Overall**

Restrict at 100 µm around primary.



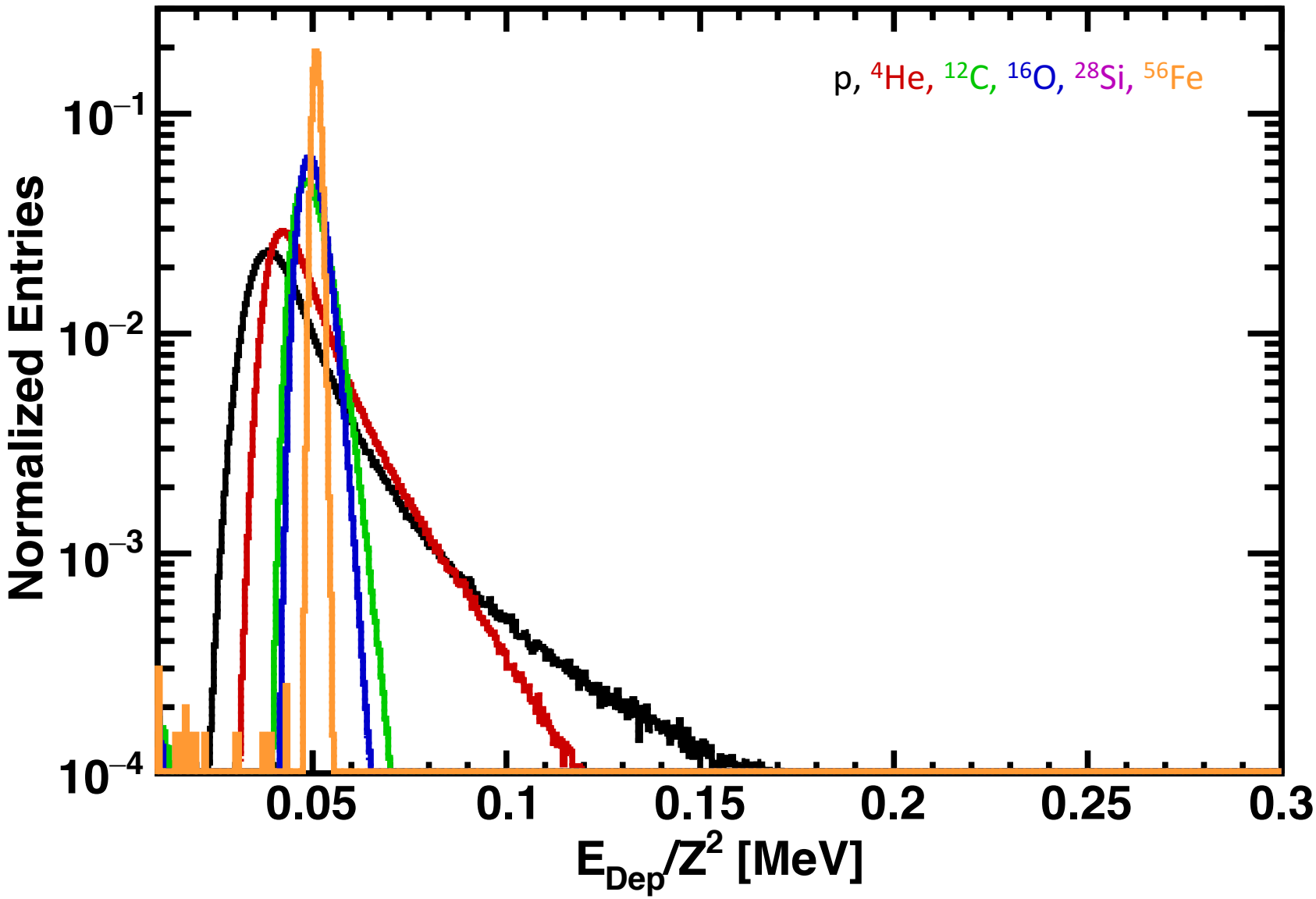
Last Layer Energy Deposit: **Overall**

Reference is with backsplash and no interactions “from above”.



Last Layer Energy Deposit: **Overall**

Restrict at 100 µm around primary.



Conclusions

We are able to the HerdSoftware, and we see similar things to what has been done with the simple geometry.

Many things still to be seen, that require more production at several energies.

Optimize the design in terms of **number of planes** and **thickness**.

Introducing some **realistic material before and between layers** to estimate the effect of “down-ward” interactions (tails and charge migrations).

Optimize **strip pitch to minimize backsplash** and interactions “from above”.

Other simulation parameters to be understood are the distance between SCD and Calorimeter, and distance between planes.

Geometry should be optimized to have **best acceptance** in Calorimeter.

On a more long term, implement a full **digitization**.