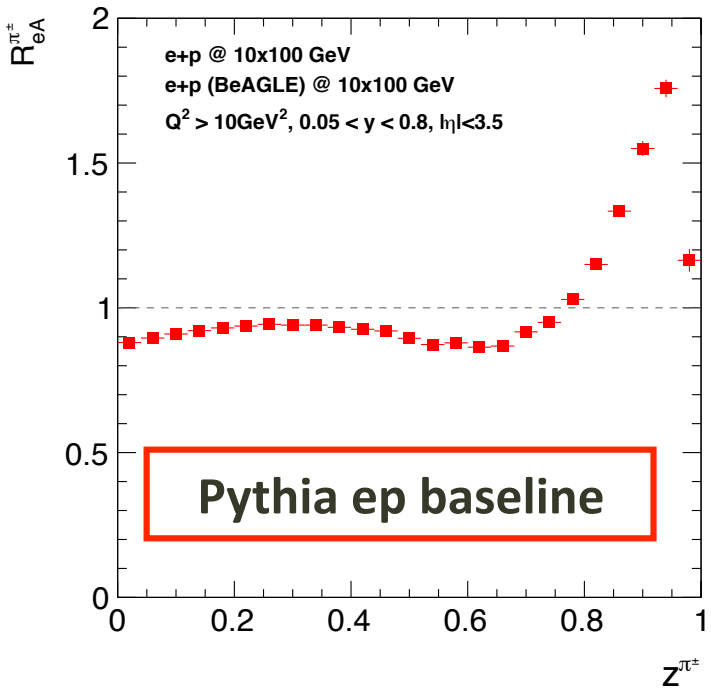
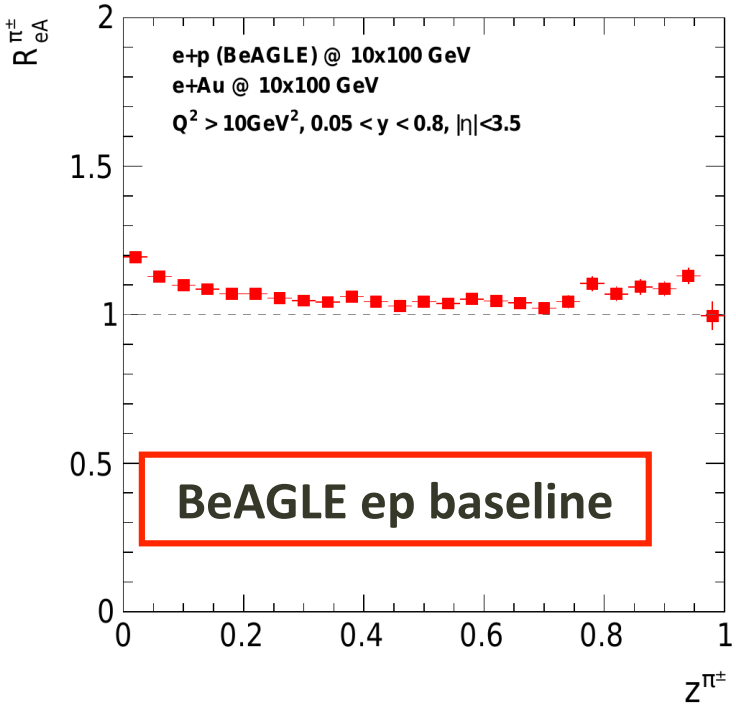
What we know so far (about BeAGLE)

- BeAGLE paper (huge thanks to Yuxiang!)
  - https://arxiv.org/pdf/2204.11998.pdf
  - Documented the “knobs” in BeAGLE and how they are tuned
  - Tuning of default pythia parameters in Sec. III. A
  - Explanations of Intra-nuclear cascade in Sec. II. B
- Energy loss effect is not in the version we are using
  - Code ready in development branch, some addtional checks by Carolina before merging into the master branch
  - Github link: https://gitlab.in2p3.fr/BeAGLE/BeAGLE/-/tree/master/PyQM
  - Ref: https://arxiv.org/pdf/2203.16665.pdf

What we know so far (about BeAGLE)

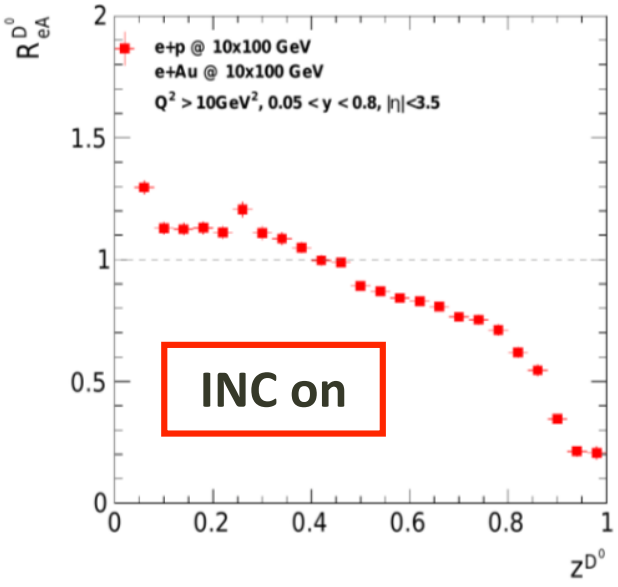
- Discrepancy between BeAGLE ep and Pythia6 ep
  - Using BeAGLE e+p as baseline fix the weird R_{eA} shape for pions
  - Different parameters for the pythia input card in BeAGLE and PythiaeRHIC
  - Now checking if BeAGLE will agree better with Pythia6 for ep when using the same parameters (and what parameters have the largest impact)
  - Details of tuned parameters and data used for tunning can be found here: https://arxiv.org/pdf/2204.11998.pdf

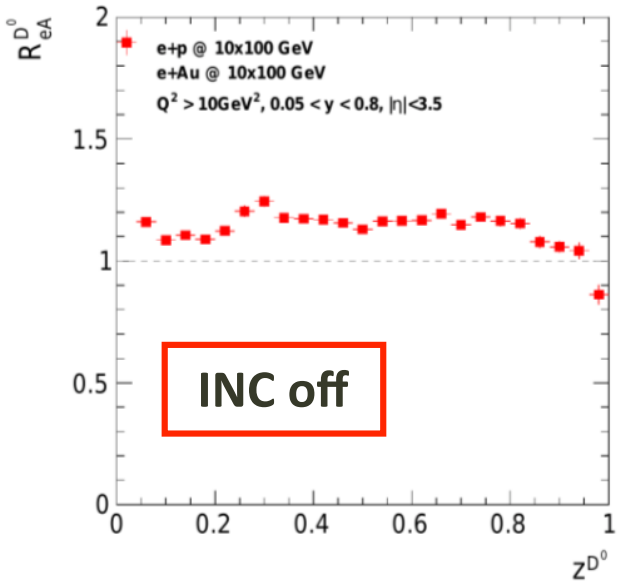


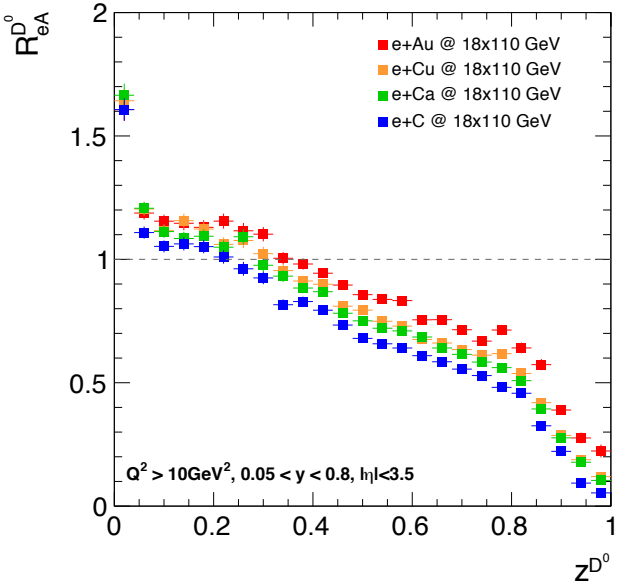


INC effect and the impact of formation time τ_0

- Intra-nuclear cascade (INC) is the main factor which caused the shape of modification for R_{eA} of charm hadrons
  - Secondary low-energy interactions with spectator nuleons
  - Controled by formation time τ_0 (default = 10fm) and # of generations (default = 25, 0 means no INC)







  - Why it has such effect on the charm-hadron production: charm-hadron lose energy during intra-nuclear cascade? How that explains the system size dpendence?
  - Now looking into different formation time (0.5fm, 2fm, 10fm, 20fm)

Nucleus sizes

arXiv:2011.14909

Table2

Name	R [fm]	a [fm]	w
^{28}Si	3.34	0.580	−0.233
^{32}S	2.54	2.191	0.16
^{40}Ar	3.53	0.542	0
^{40}Ca	3.766	0.586	−0.161
^{58}Ni	4.309	0.517	−0.1308
^{63}Cu	4.2	0.596	0
^{63}CuHN	4.28	0.5	0
^{129}Xe‖	5.36	0.59	0
^{129}Xe**	5.42	0.57	0
^{186}W	6.58	0.480	0
^{197}Au	6.38	0.535	0
^{197}AuHN	6.42	0.44	0
^{207}Pb††	6.62	0.546	0
^{207}PbHN	6.65	0.46	0
^{208}Pb (prot)	6.68	0.447	0
^{208}Pb‡‡ (neut)	6.69	0.560	0