

All-Silicon Tracker Updates: ATHENA Magnetic Field Options

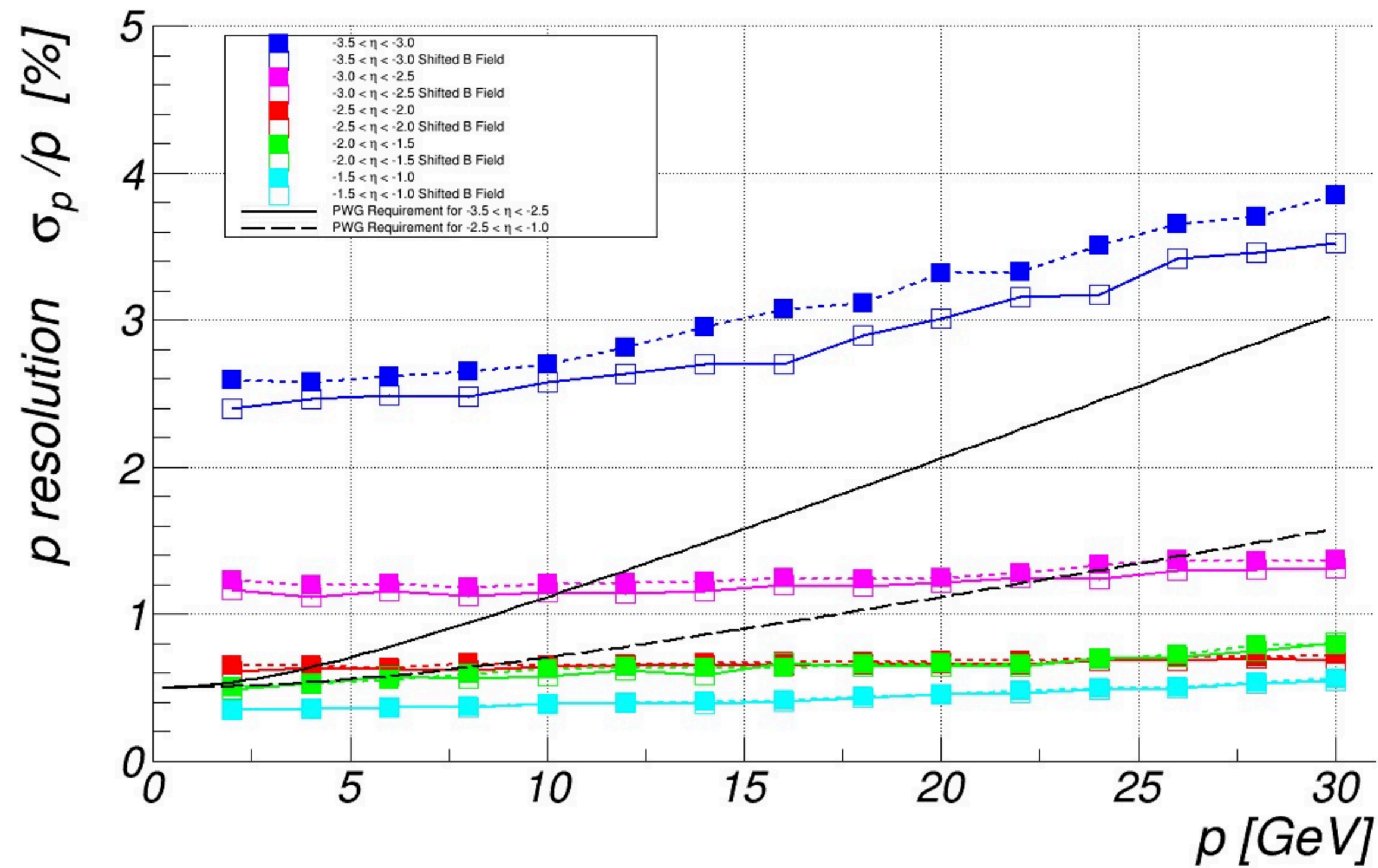


Rey Cruz-Torres
ATHENA Tracking Meeting
10/12/2021

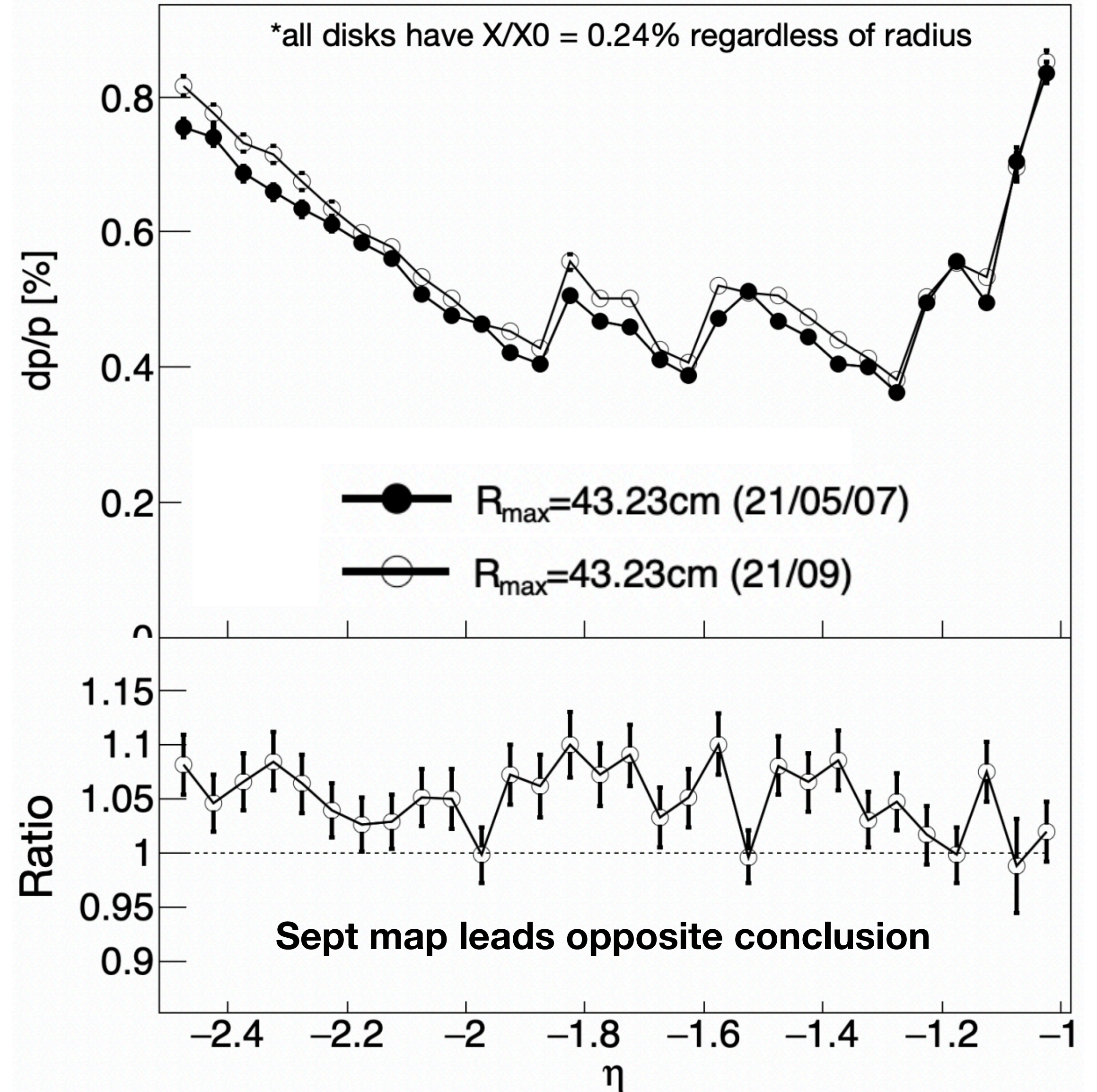
To Recap

See my slide 12 [here](#)

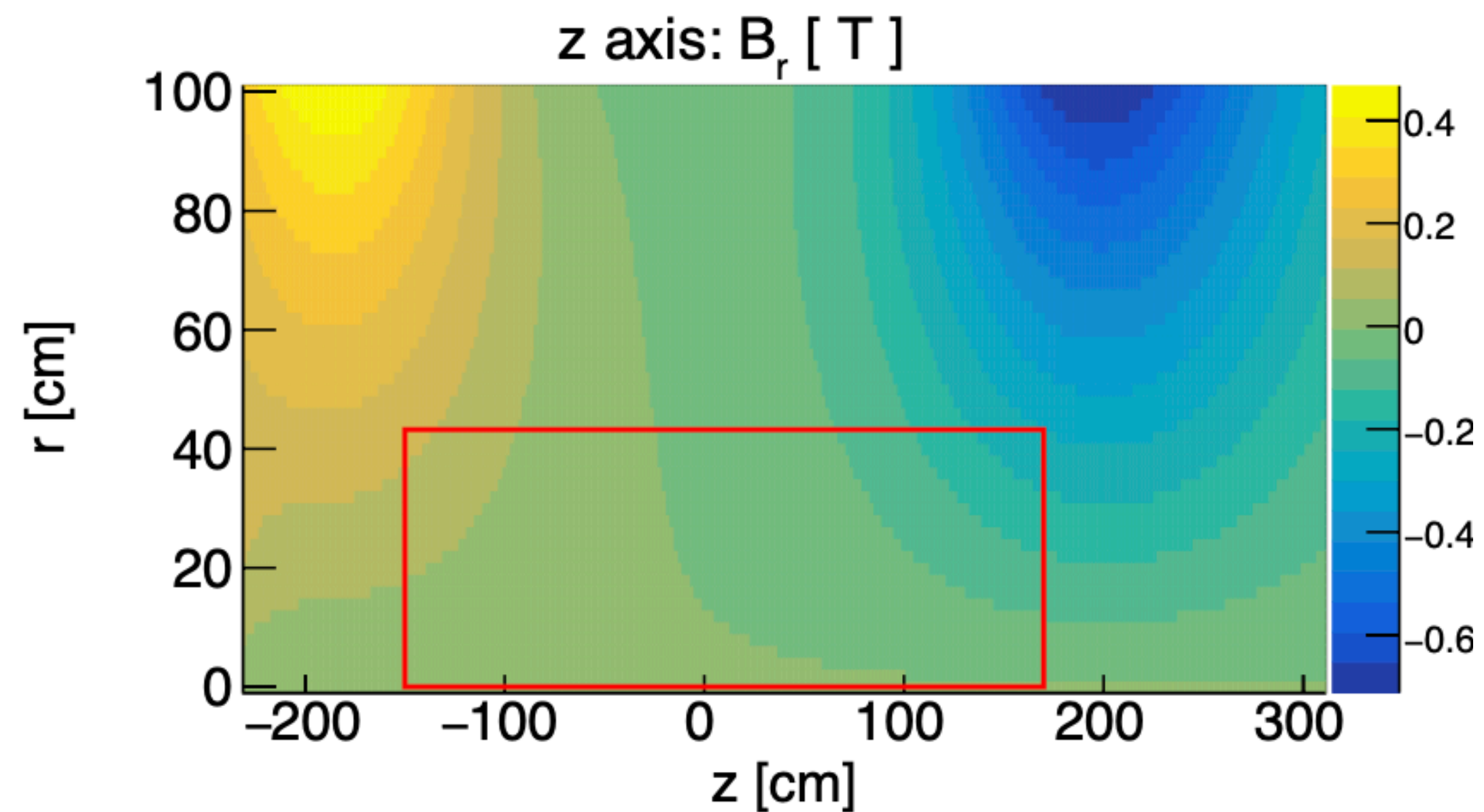
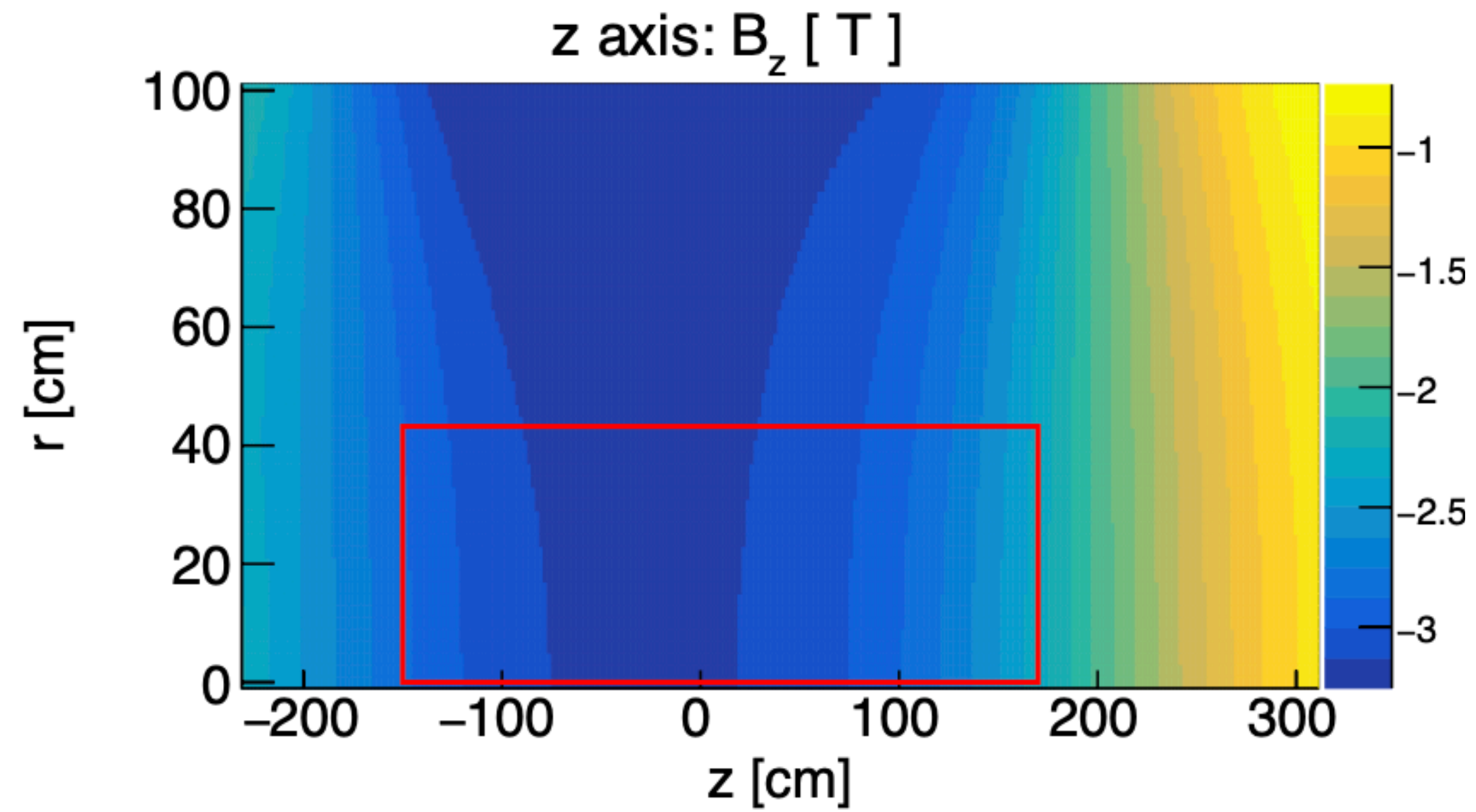
See Nick's slide 5 [here](#)



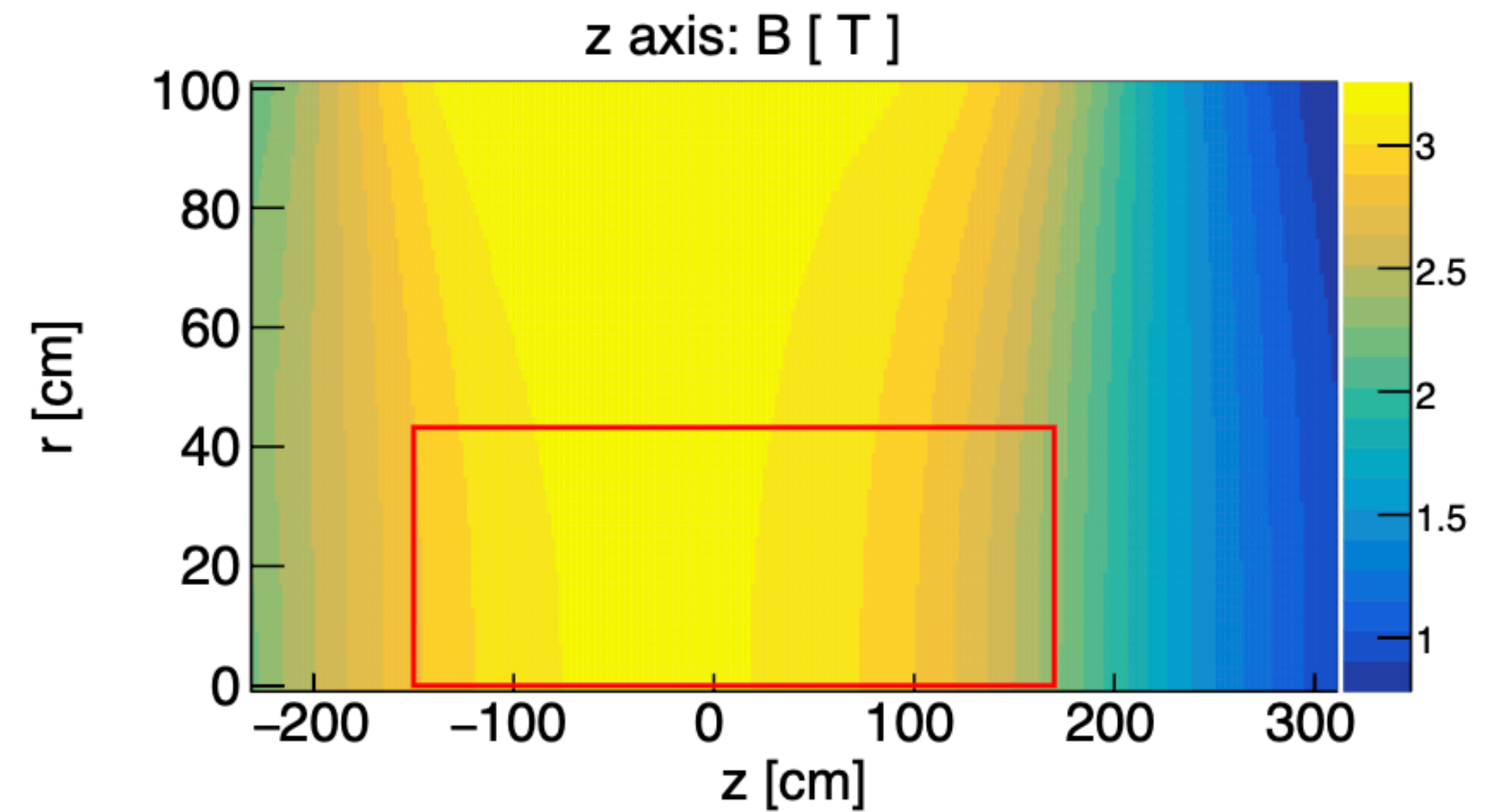
Shifted map leads to better momentum resolution performance in the backward region compared to May map.



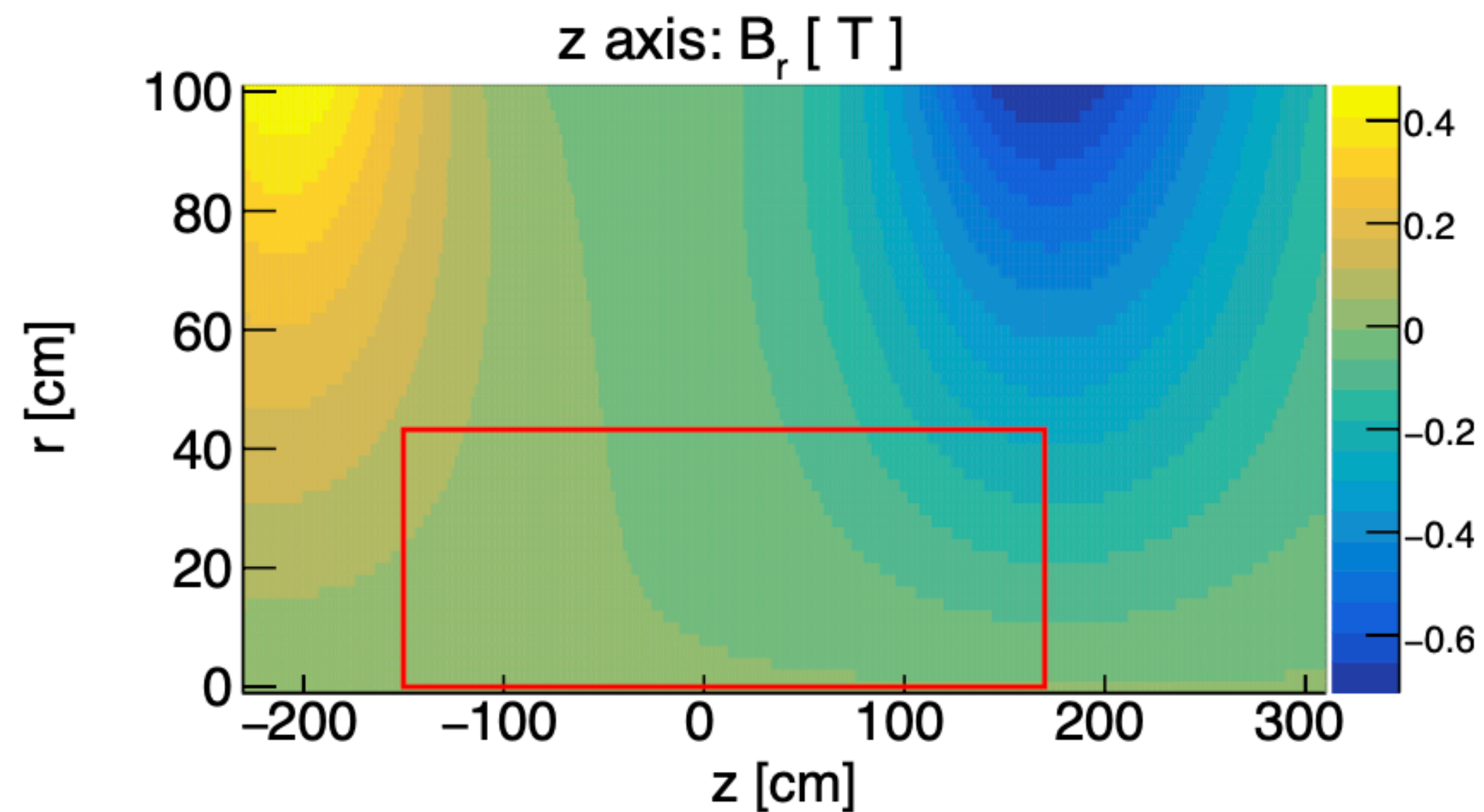
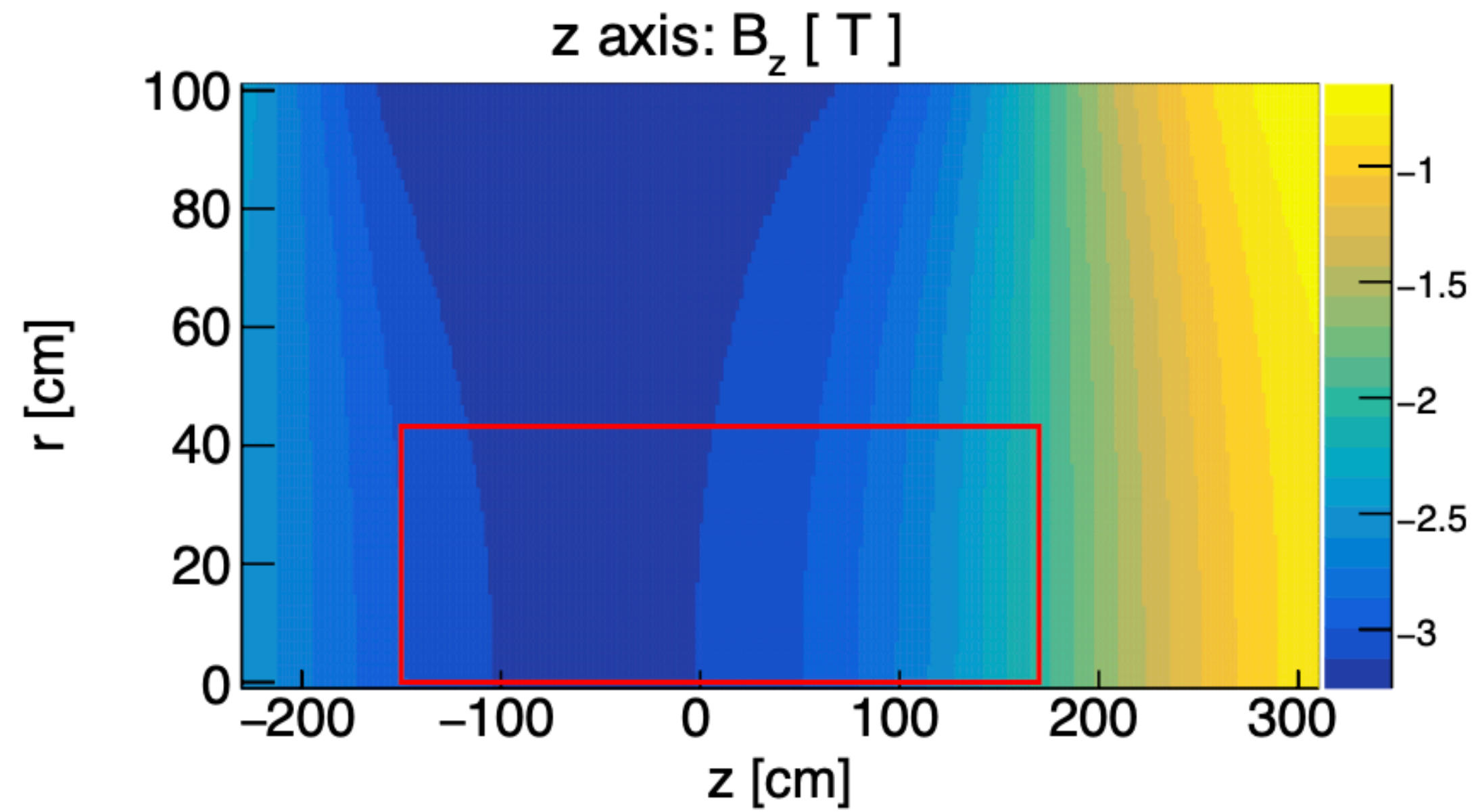
Magnetic Field Choices



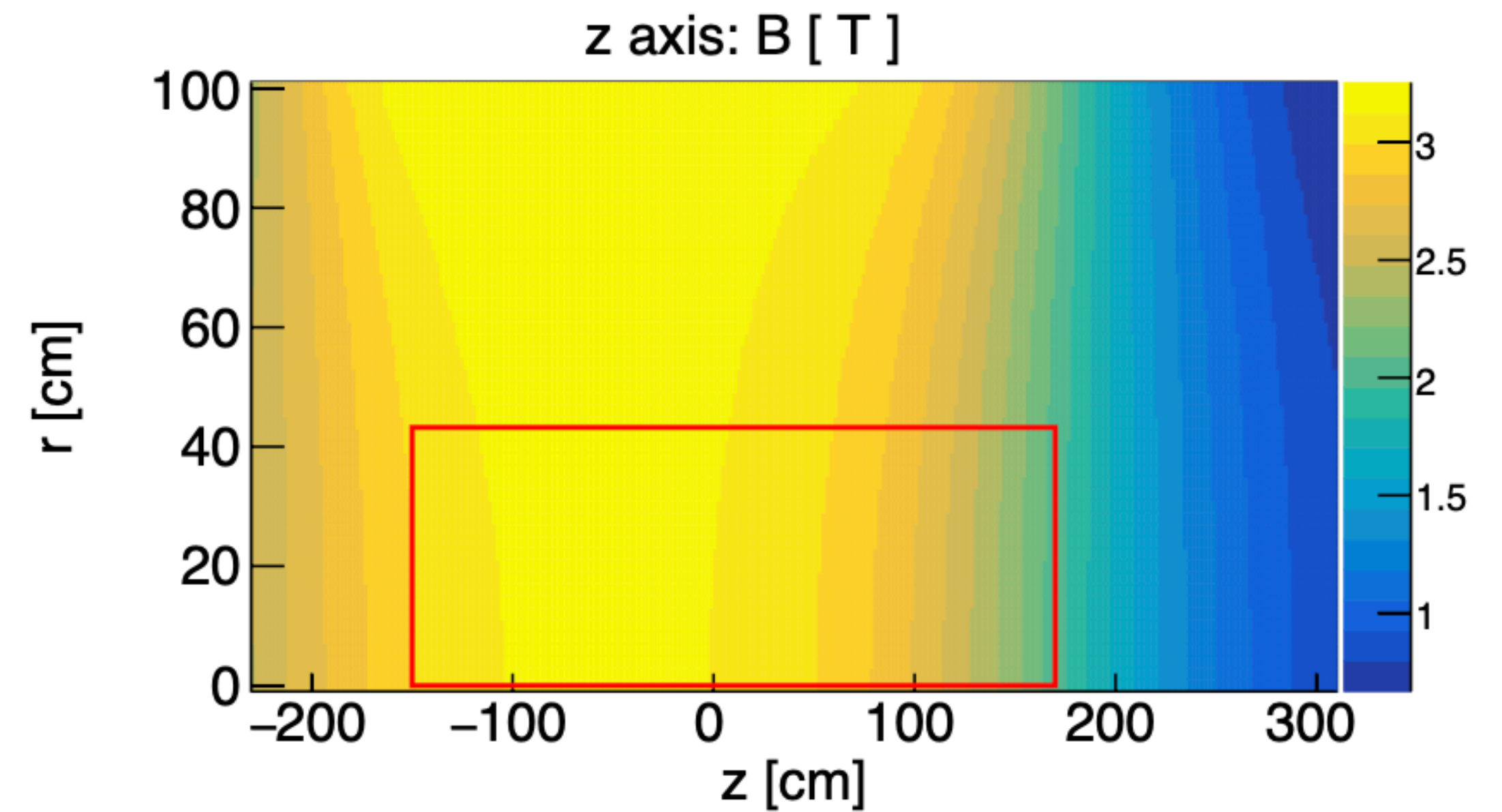
May 7th Release



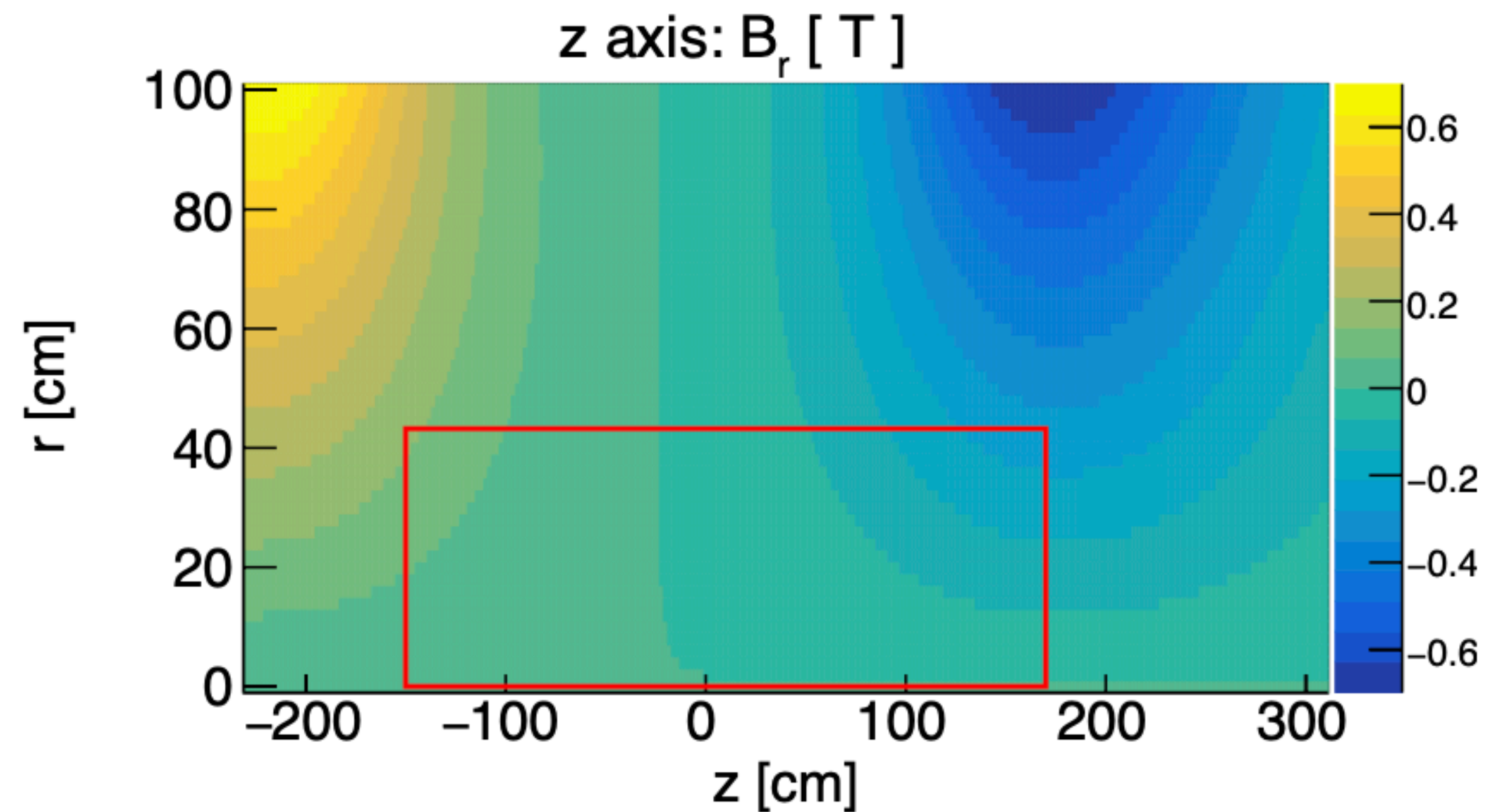
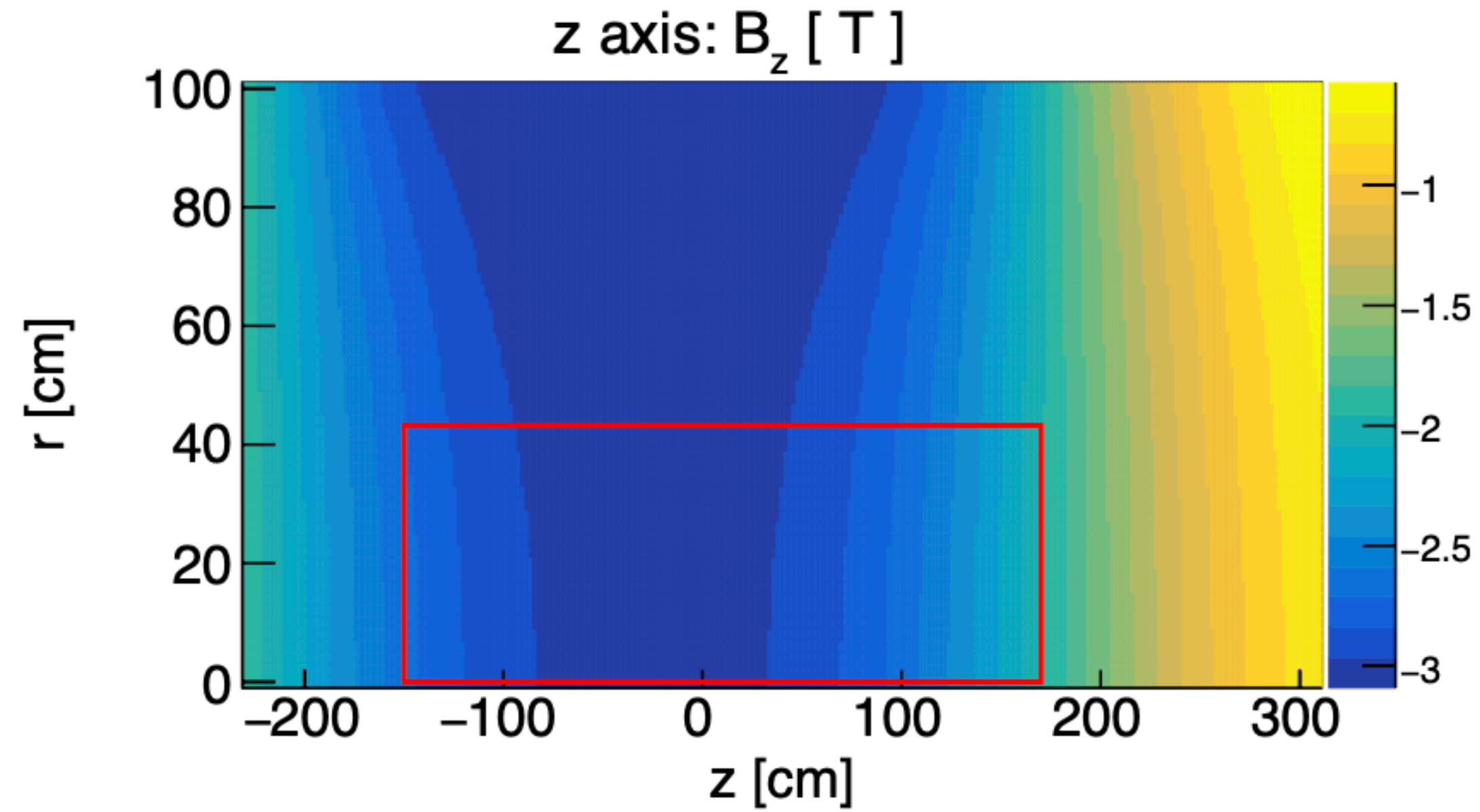
Magnetic Field Choices



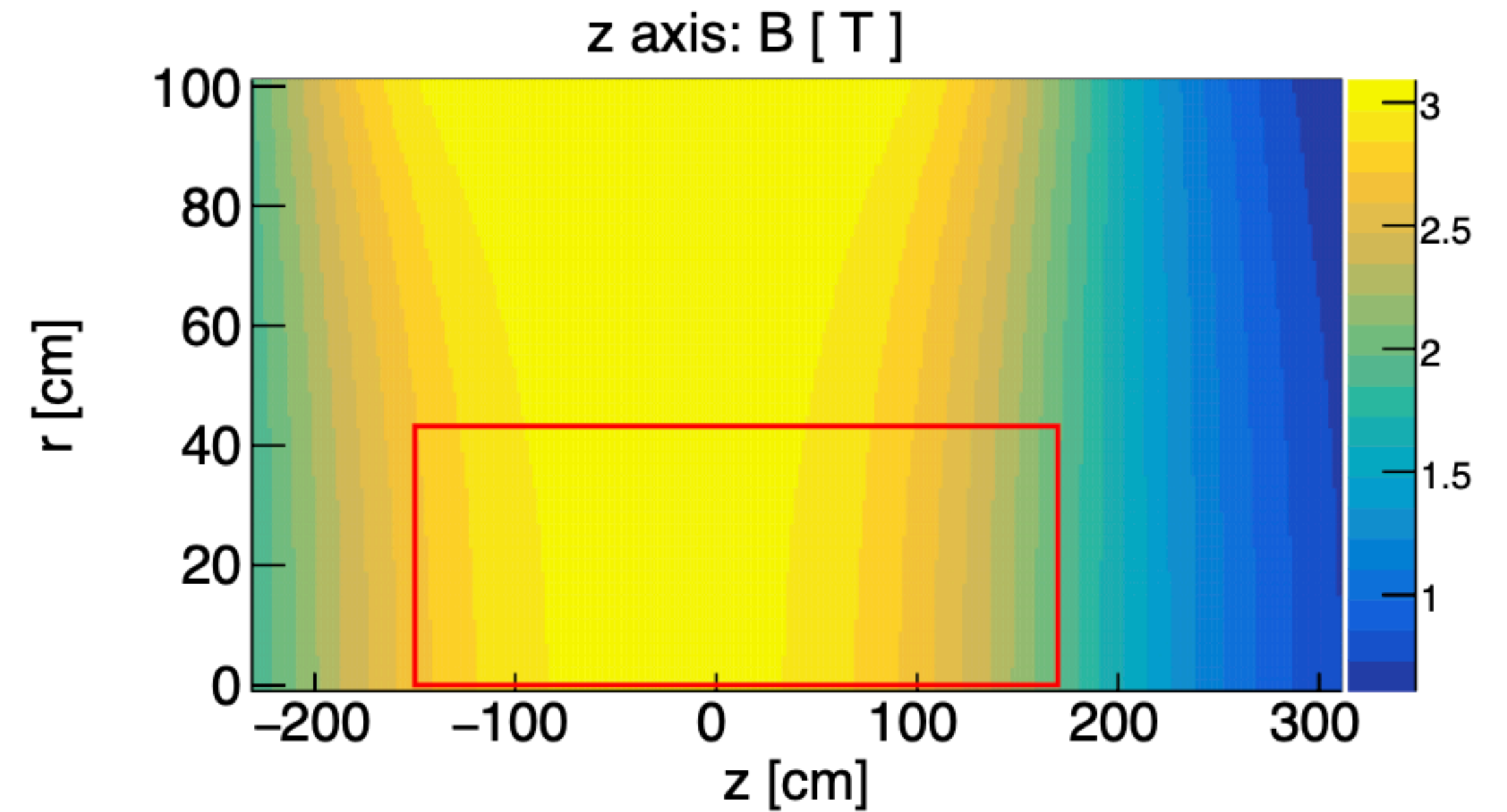
May 7th shifted by 25 cm



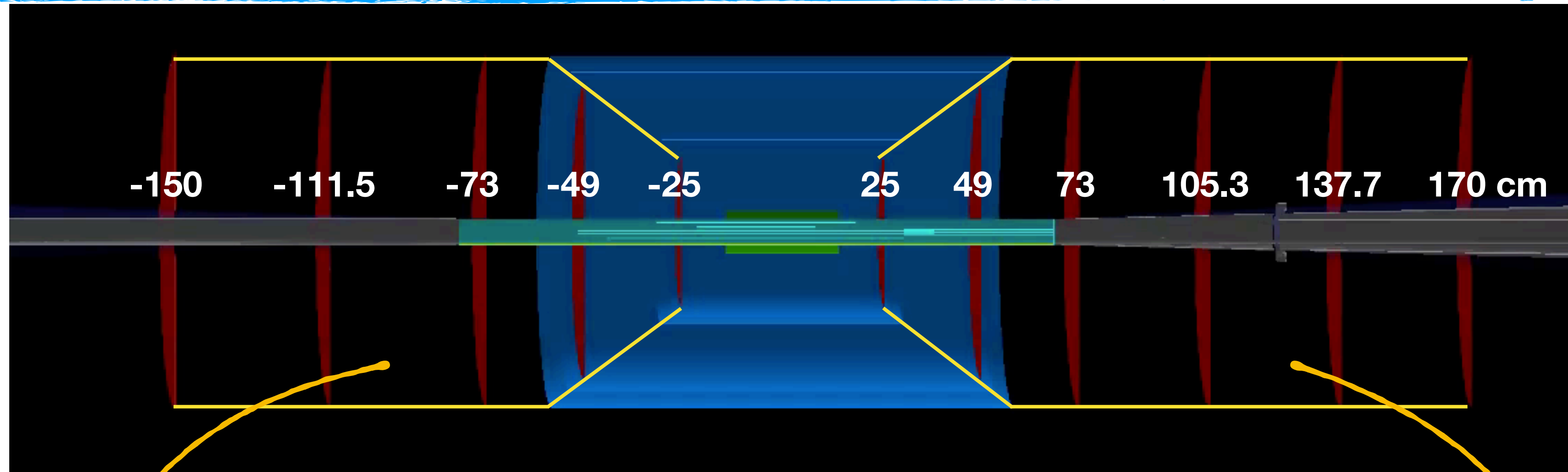
Magnetic Field Choices



September 2021 release



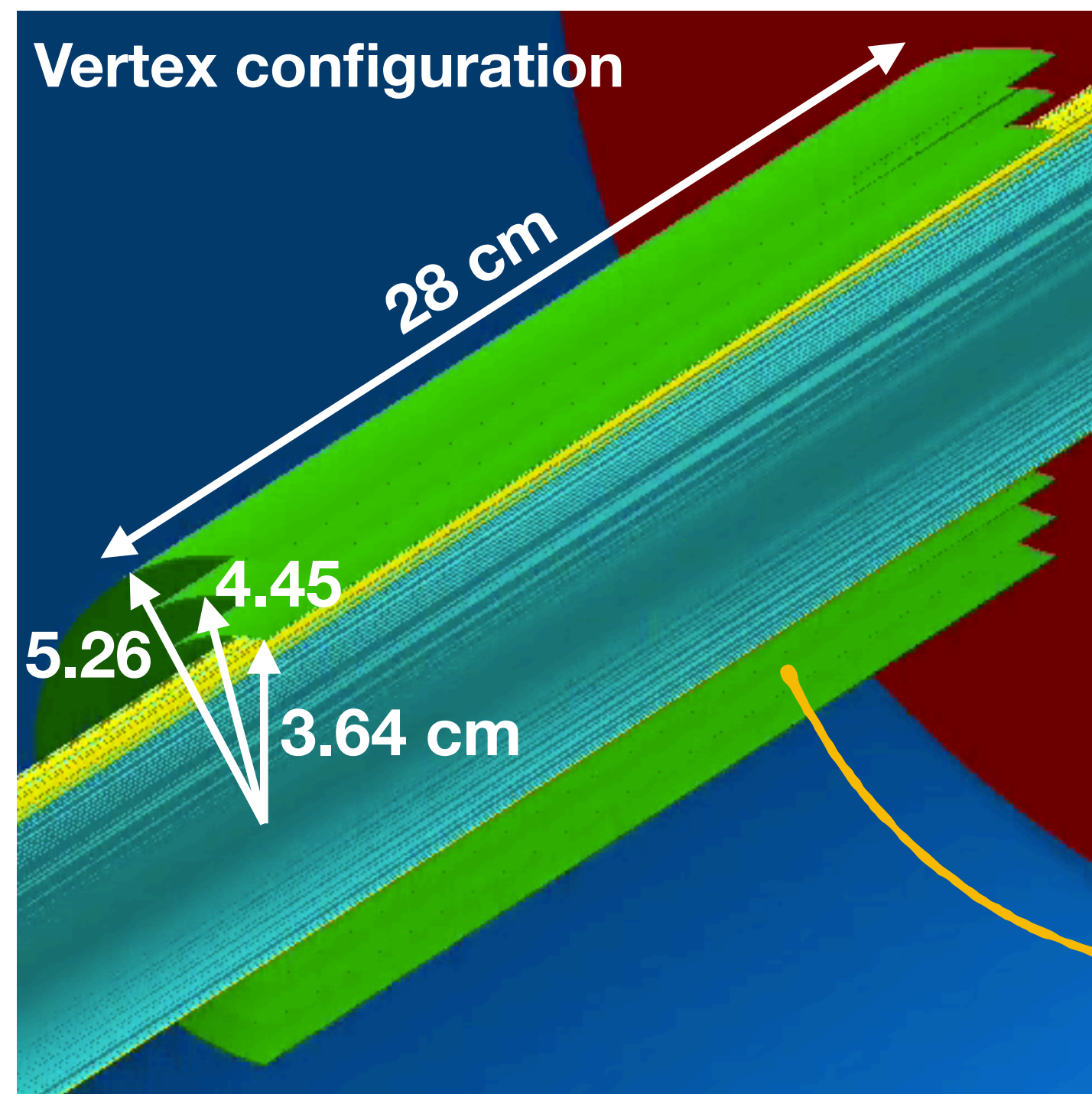
Detector Configuration



5 disks in the backward region (0.24% X0)

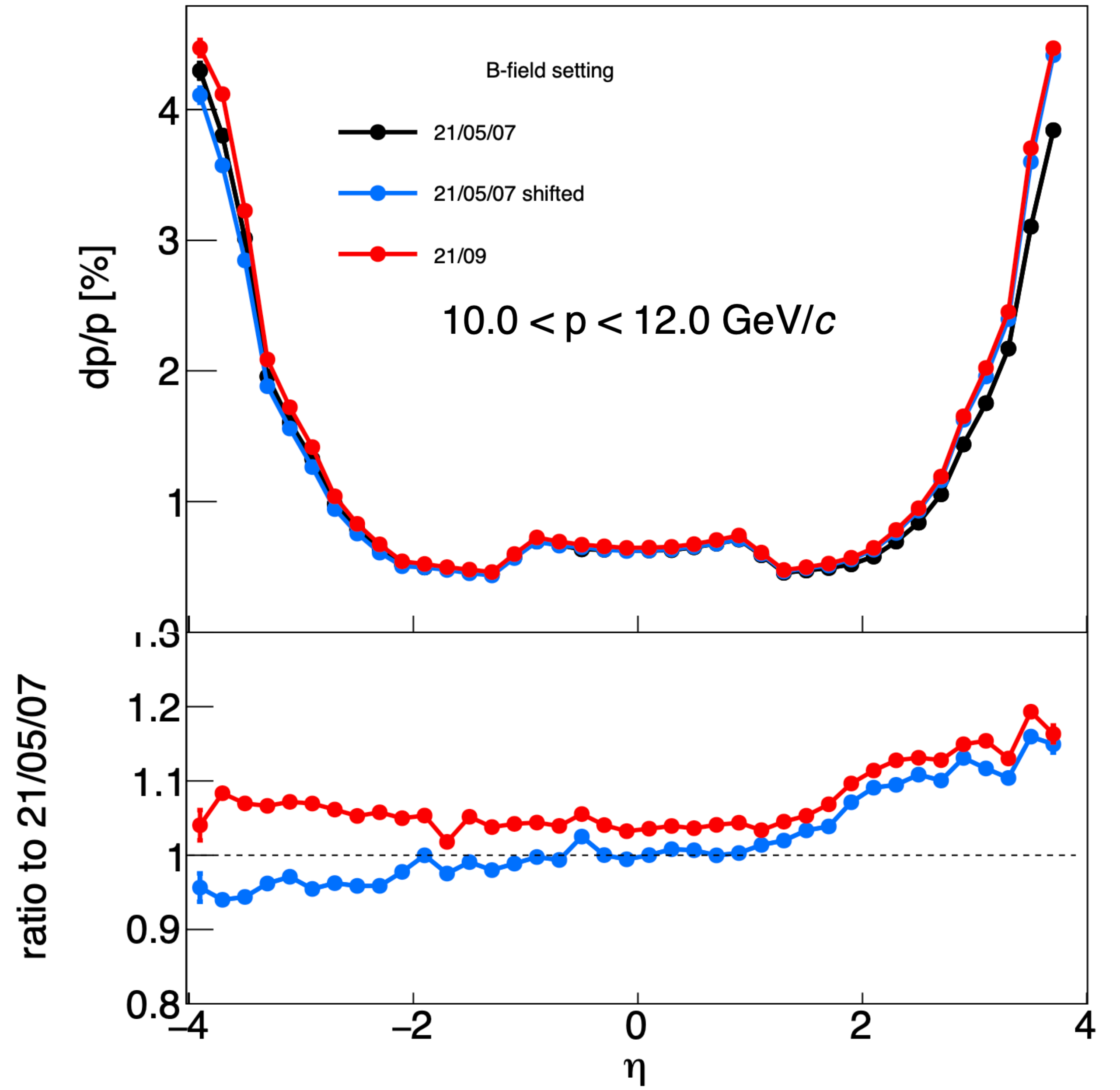
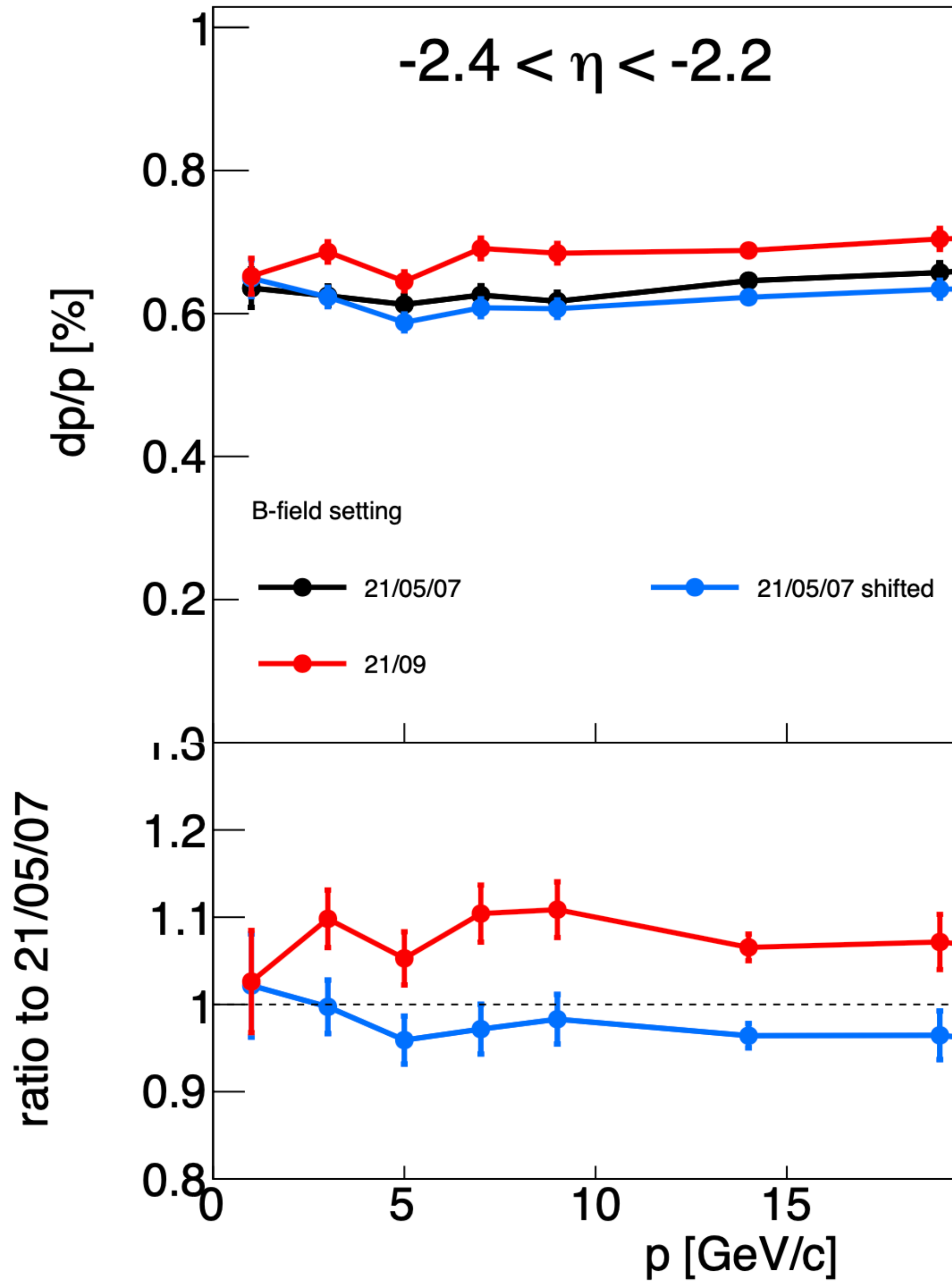
6 disks in the forward region (0.24% X0)

Same barrel configuration as before (0.55% X0)

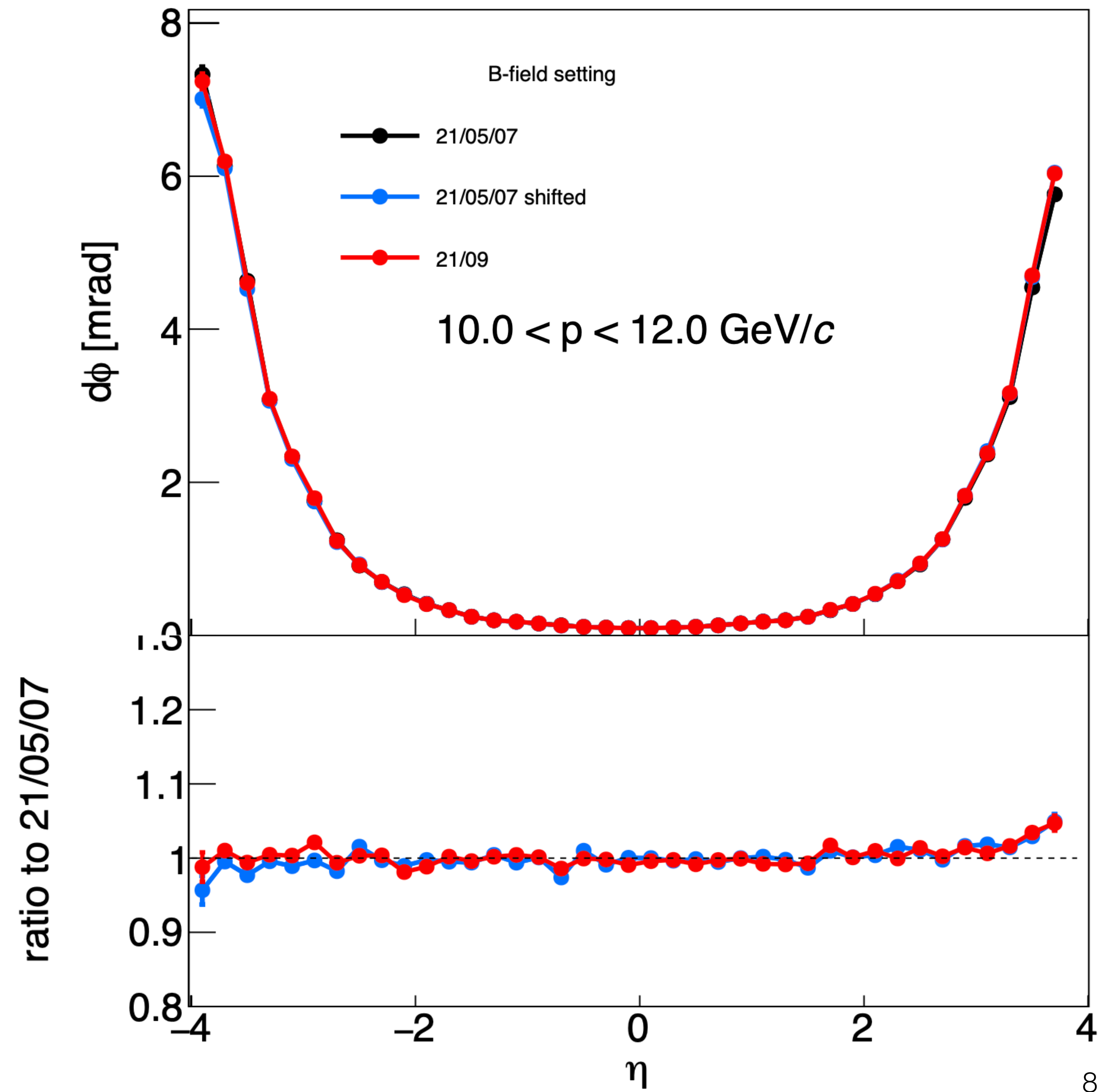
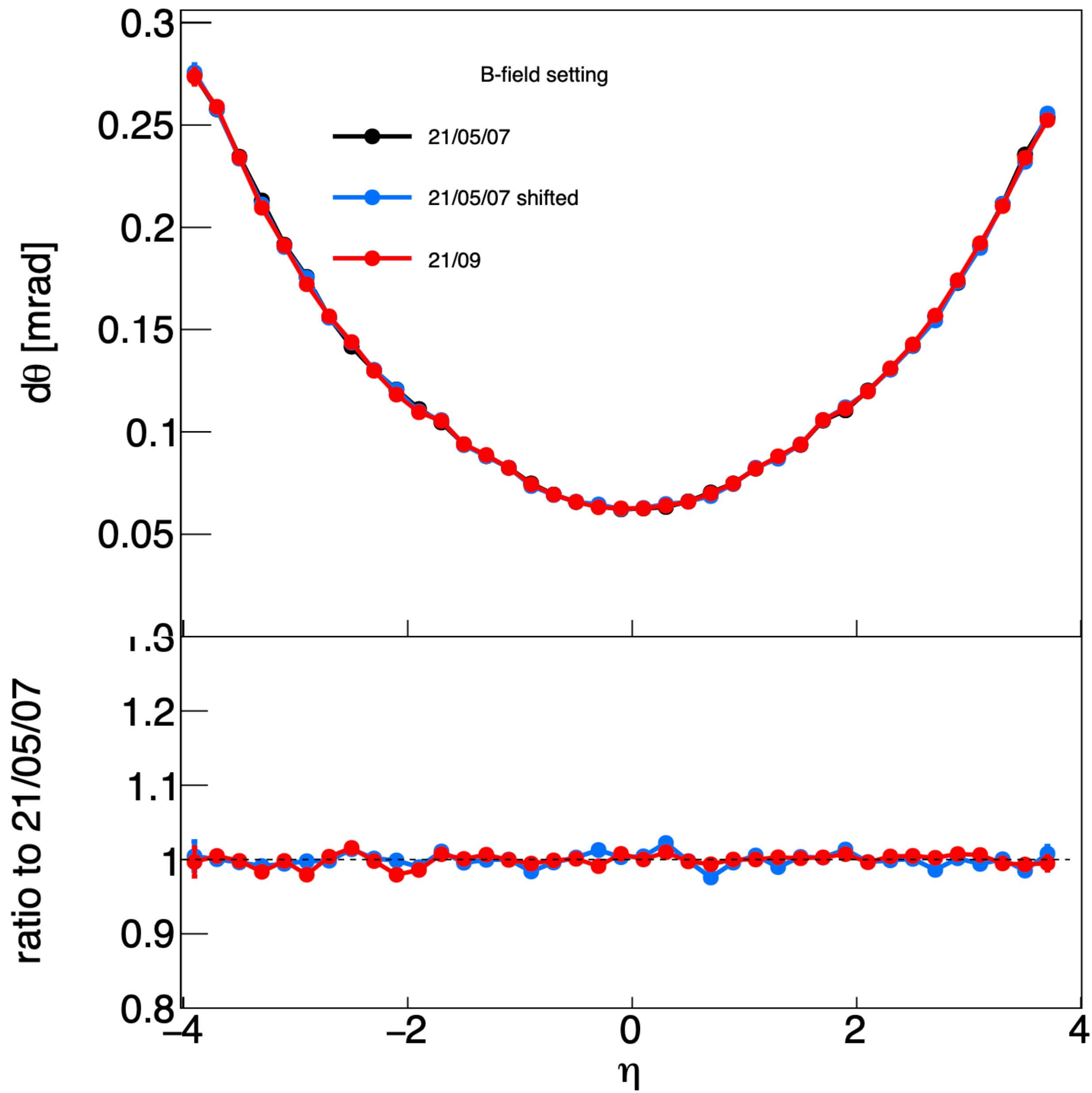


3 (shorter) vertexing layers (0.05% X0)

Momentum Resolution



Angular Resolutions (at vertex)



Summary

- ❑ Studied all-silicon tracker performance coupled with three ATHENA magnetic-field maps
 1. ATHENA 05/07/21
 2. ATHENA 05/07/21 (shifted)
 3. ATHENA 09/21
- ❑ The **shifted** and **September** maps are not the same object
- ❑ Momentum resolution worse in **shifted** and **September** maps relative to **May** map in highest forward pseudorapidities (up to 15%)
- ❑ Momentum resolution better (by a few %) in the highest backward pseudorapidities with **shifted** map relative to **May** map
- ❑ Momentum resolution worse (by a few %) in the highest backward pseudorapidities with **September** map relative to **May** map
- ❑ No significant change in the angular-resolution performance