SVT disk positions in the hadron arm

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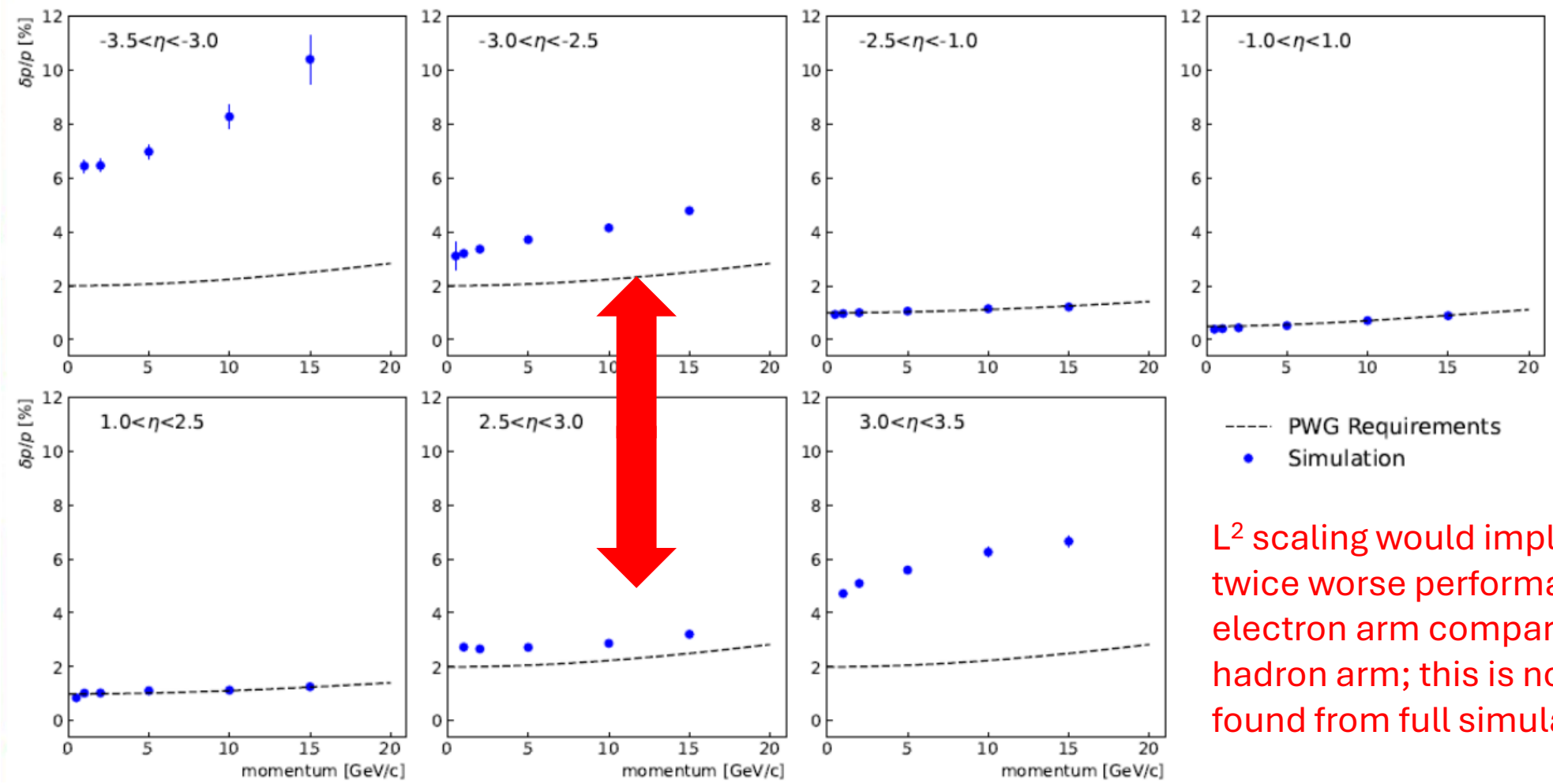
SVT disk positions in the hadron arm

- Originally, the hadron harm of the SVT has five disks with (positive) z positions between z = 25 cm and z = 135 cm,

- Progress in ePIC overall integration has led to a new constraint, limiting z to just over 120 cm,

- Reducing the lever arm (L) will degrade momentum resolution,
- The effect is typically not as bad as one might expect from L^2 scaling, as is easily appreciated by comparing the simulated performance with that from the (shorter; |z| < 102 cm) electron arm,

Simulated momentum resolutions



L^2 scaling would imply roughly twice worse performance in the electron arm compared to the hadron arm; this is not what is found from full simulations.

SVT disk positions in the hadron arm

- Basic questions include:
  - What would you expect from a reduction of max|z| from 135cm to 120cm?
  - What should the revised z positions of the five disks be?

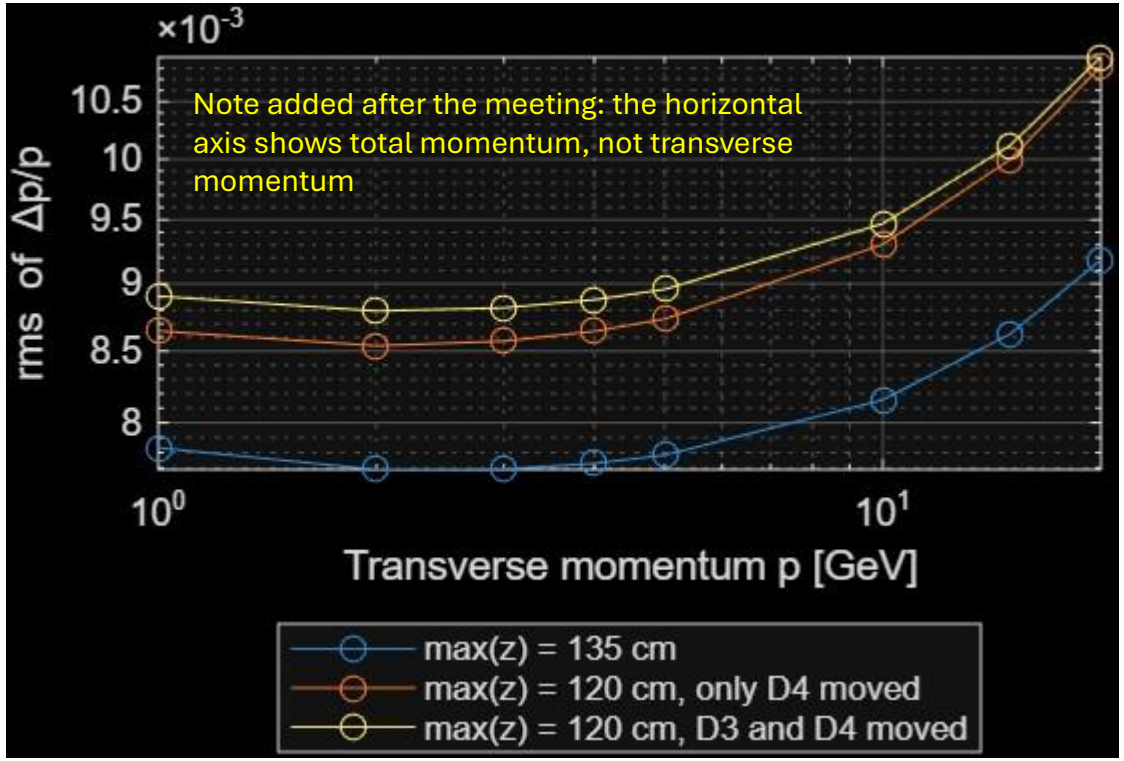
- The z-positions of the innermost disks, disk 0 and disk 1, are strongly coupled to the barrel,
- The z-position of the outermost disk, disk 4, should maximize the lever arm within constraints, i.e. z = 120 cm,

- So, the trade-offs are basically with the positions of disk 2 and disk 3,

SVT disk positions in the hadron arm

- Basic questions include:
  - What would you expect from a reduction of max|z| from 135cm to 120cm?
  - What should the revised z positions of the five disks be?

η = 2, within the acceptance of all disks



Effect from max(z) < 135 cm to max(z) < 120 cm is ~10-20% relative in dp/p from SVT standalone fast simulations,

Effect of repositioning D4 is a factor smaller; repositioning D3 is in my opinion not worthwhile,

Suggest to proceed with z = 25, 45, 70, 95, 120 cm
(was 25, 45, 70, 100, 135 cm)

Note resolution vs. η exhibits steps at large η > 2 as fewer disks are hit (or, there is more than η = 2).