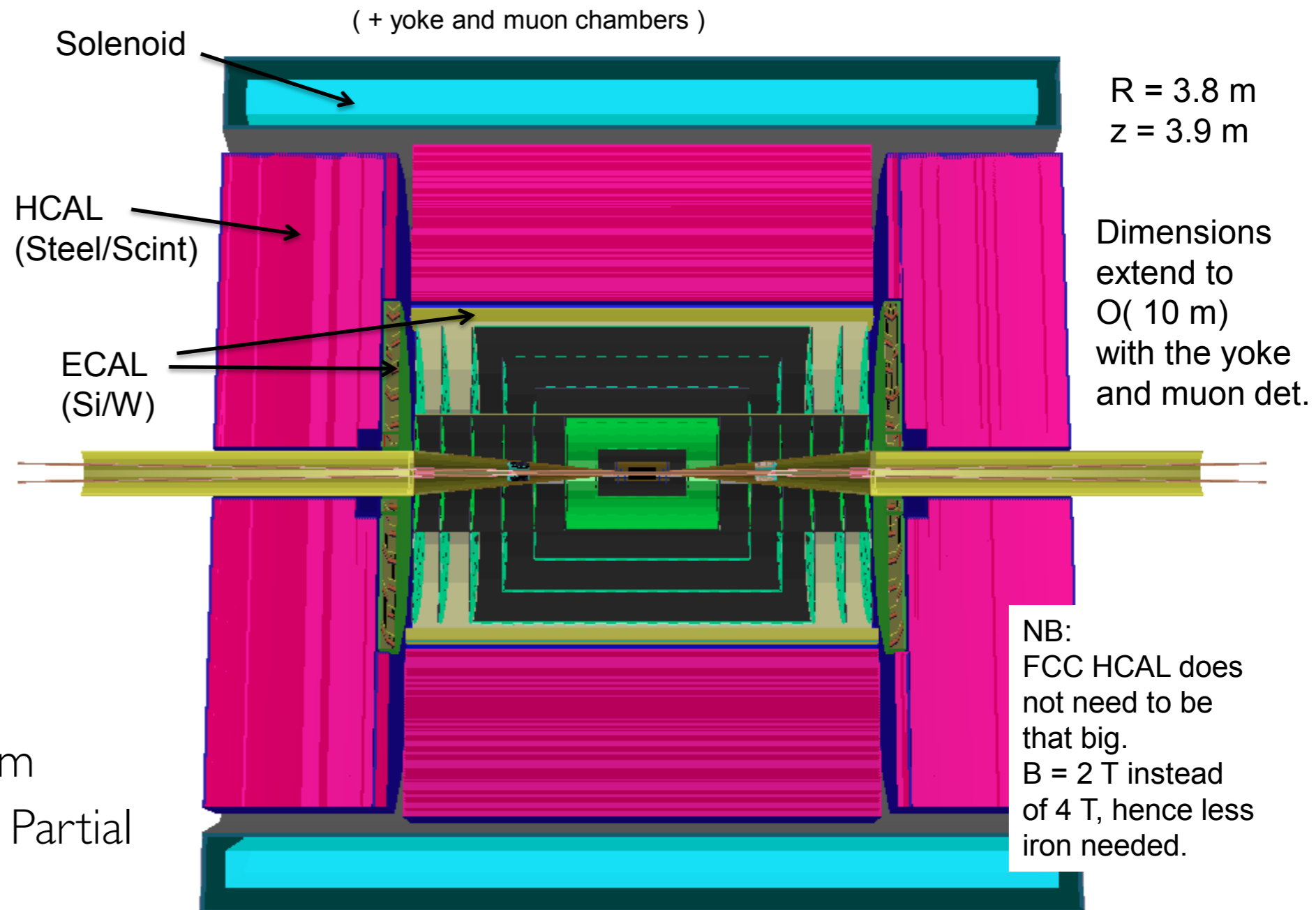




Follow up on SR Simulations

Anna Kolano
Emmanuel Perez

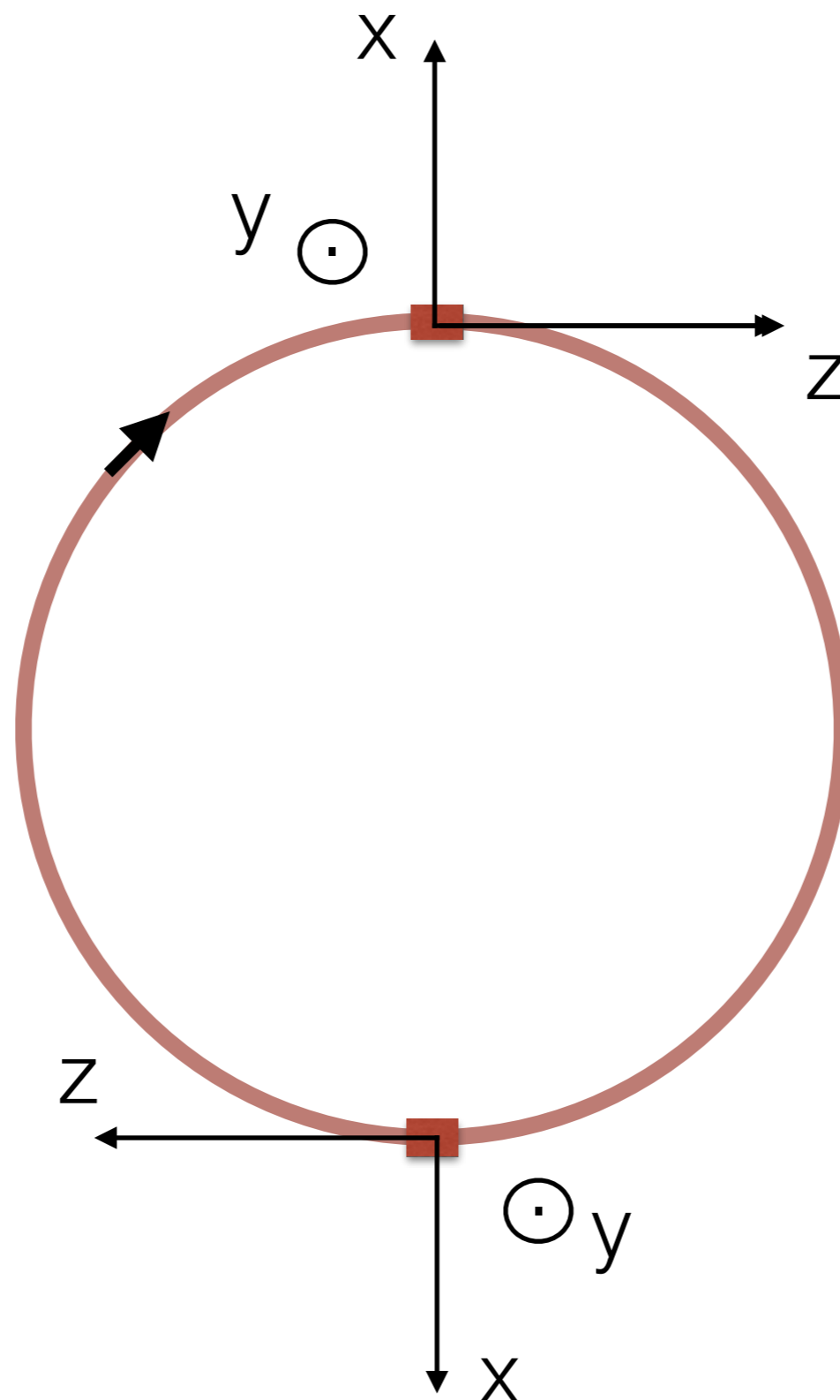
@ top energy

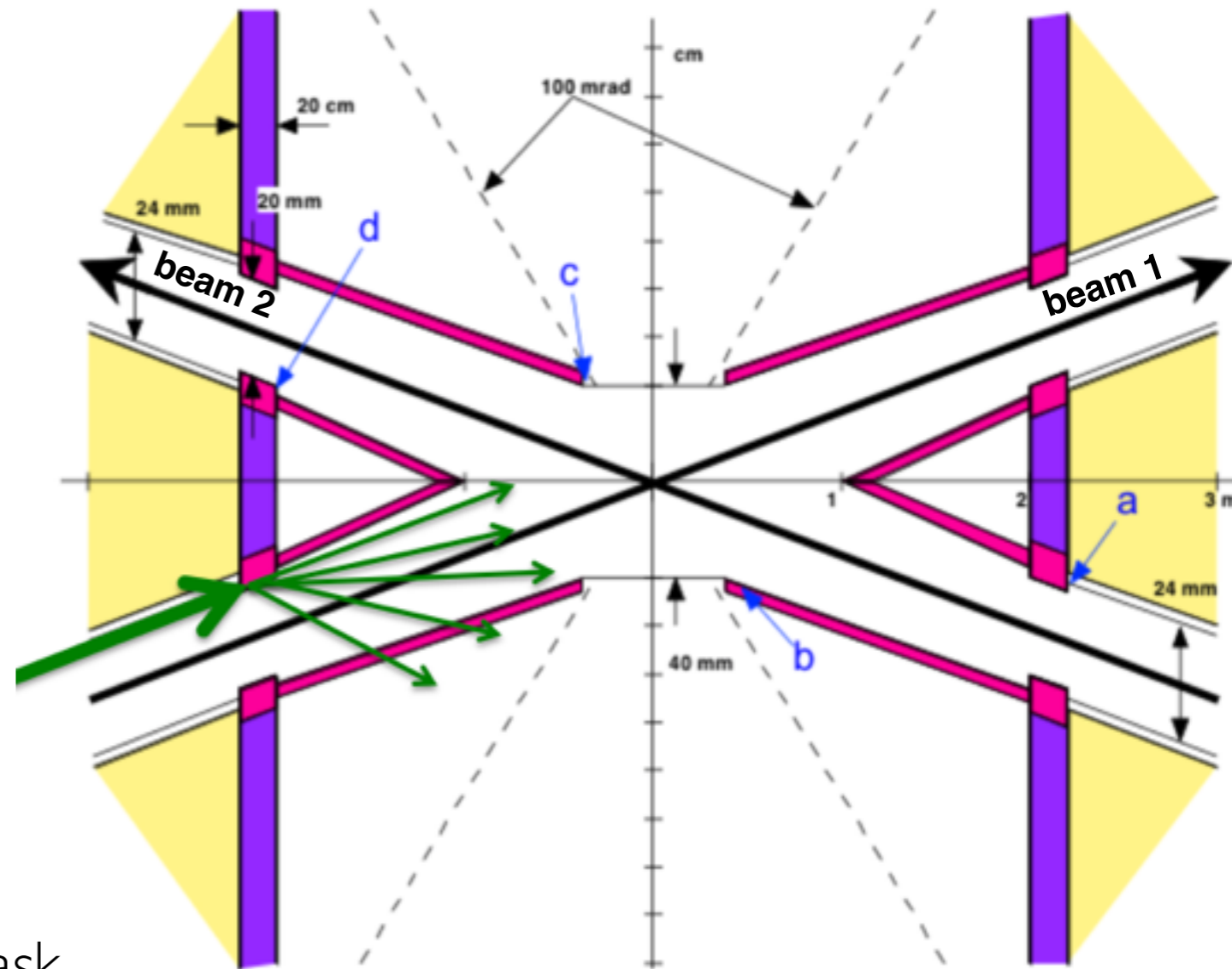
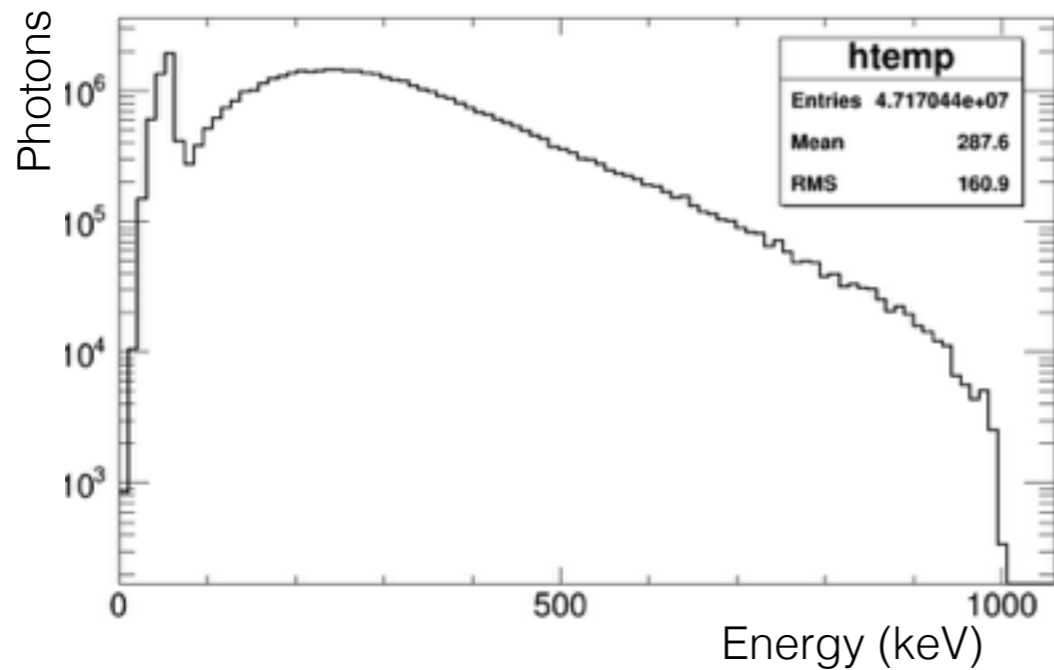


- Full statistics:
 $4.7 * 10^7$ photons/BX/beam
- Shielding/No shielding/ Partial
- LumiCal acceptance

E. Perez, Rome 2016

We understand that this is the convention and we propose to use it for all MDI studies.



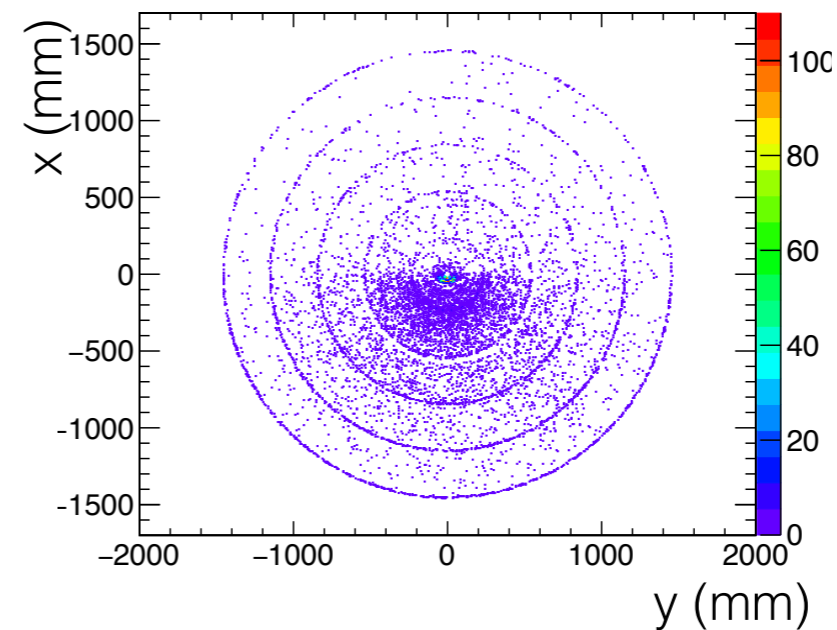
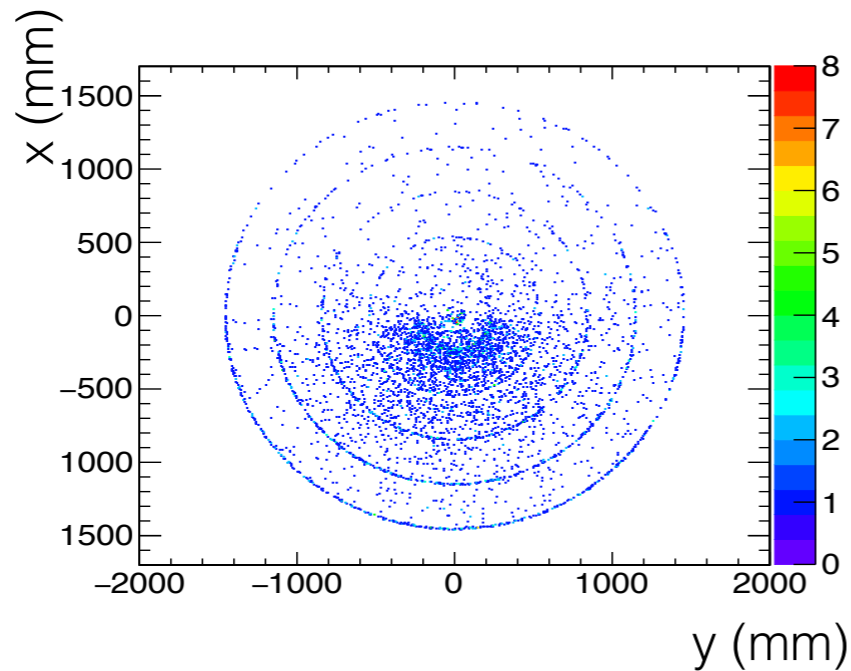
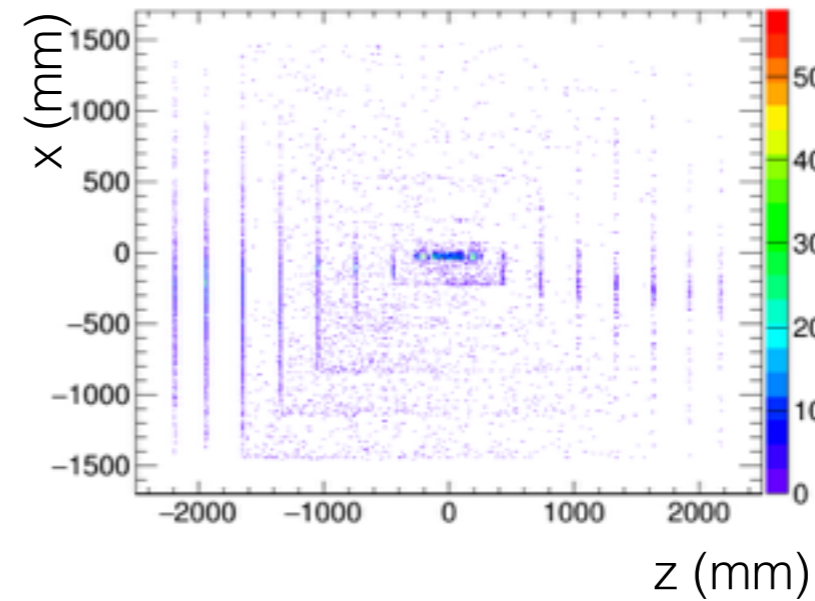
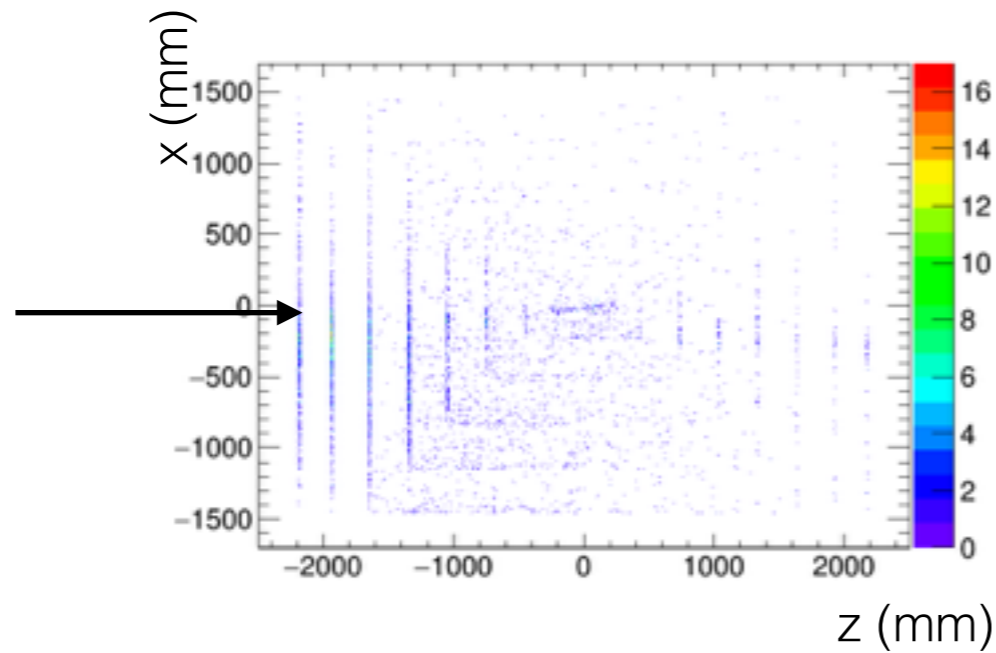


SR photons from Mike Sullivan:

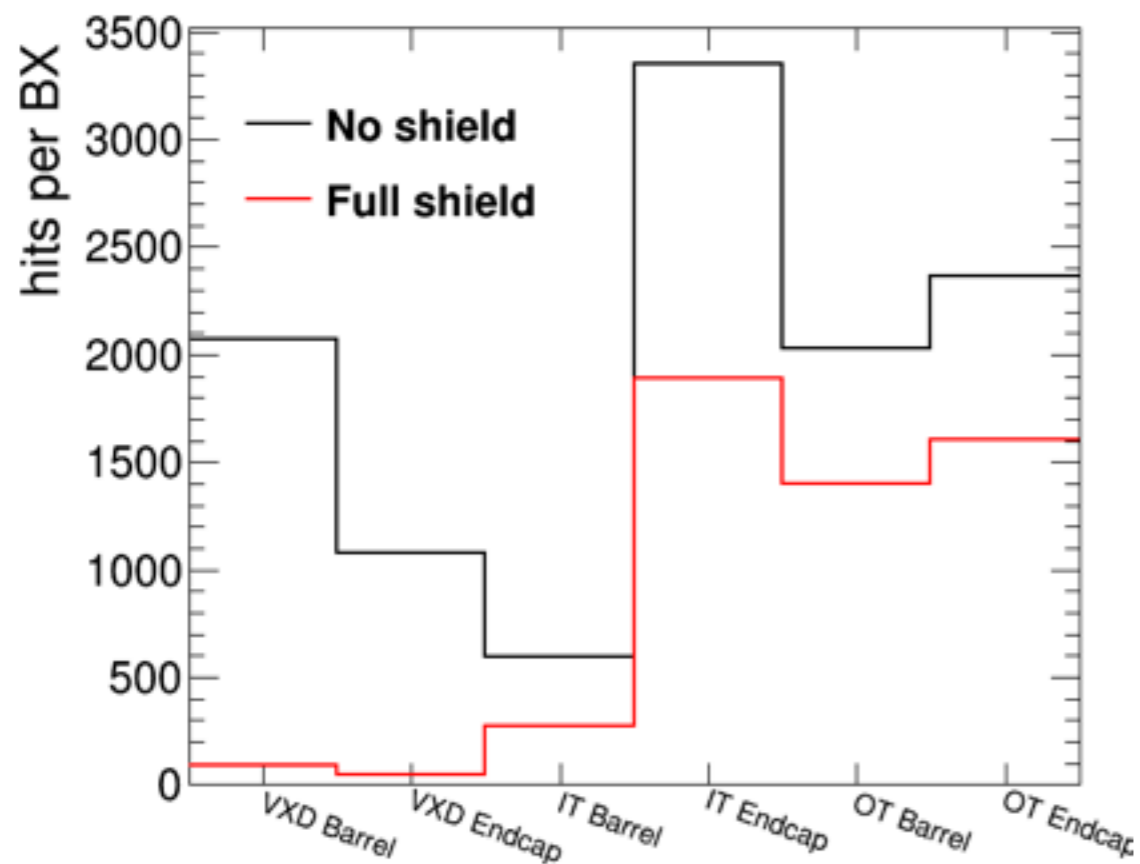
- Forward scattered photons from the mask
- $4.7 * 10^7$ photons per bunch crossing (BX) per beam
- No SR from hard bend or backscattered

Full shielding

No shielding

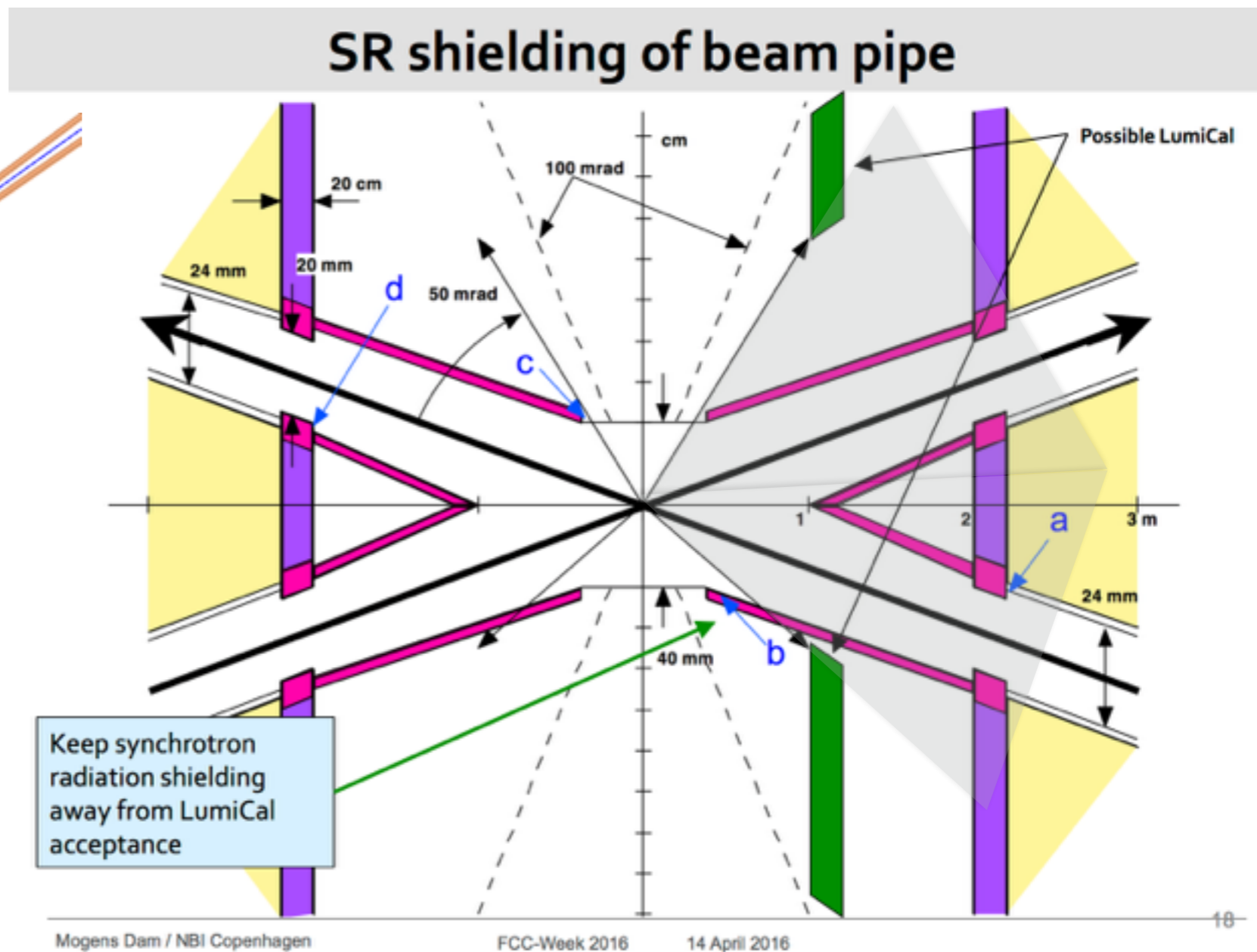


Hit maps show recorded hits locations as expected



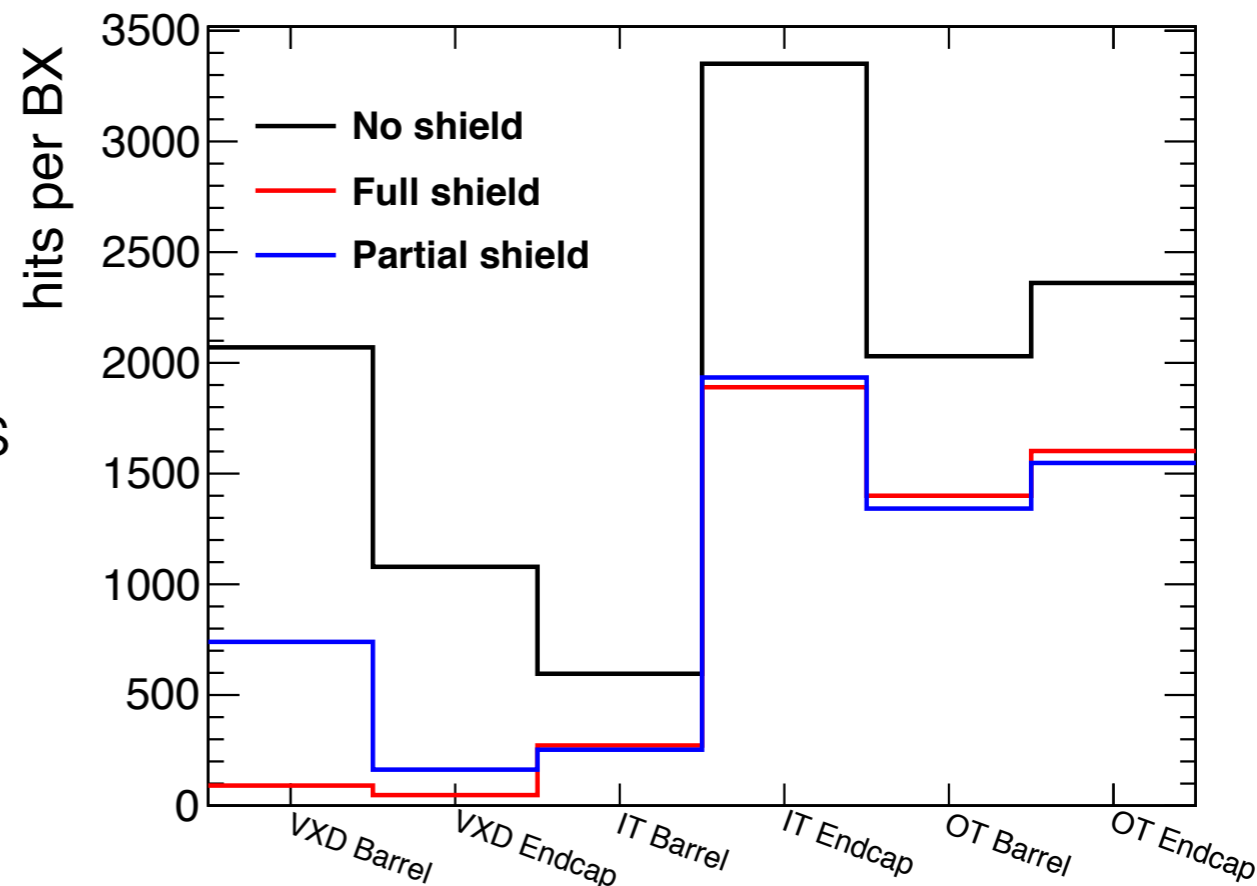
- Simulations with full Ta beam pipe shielding (red) were shown in Rome, now with more statistics
- After removing the shielding (black) the advantage of using shielding is apparent
- In the VTX itself, decreasing recorded hits by a **factor of 20**, and in total by a factor of 2

Ref: Mogens Dam talk during the FCC week, Rome 2016



- Ta is good, but we do not want to degrade the measurement of low angle electrons
- Partially removed masking 50 mrad around beam1
- For the moment shielding removed symmetrically up to $Z=82$ cm

No shielding: 11487 hits
 Full shielding: 5303 hits
 Partially removed shielding: 5980 hits
 x 2

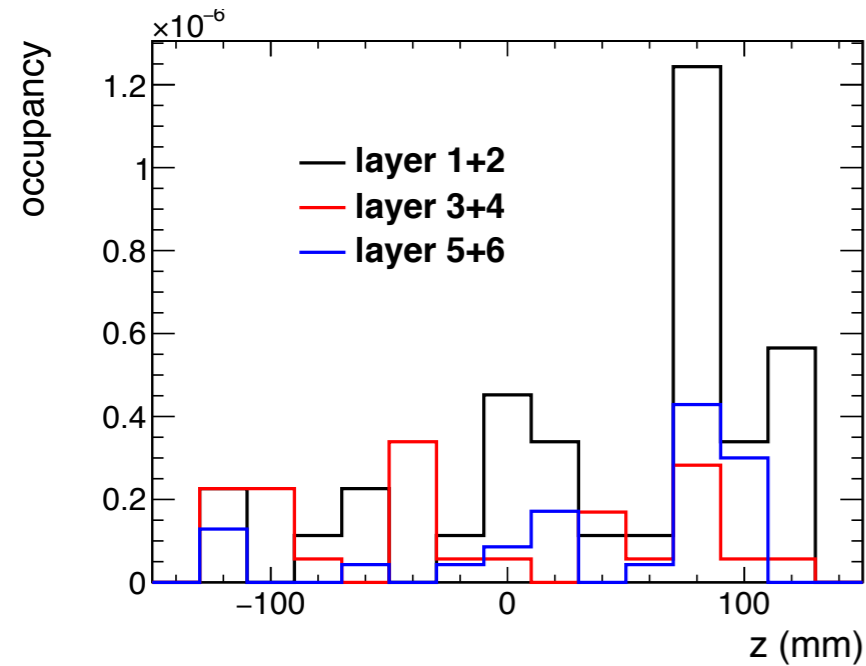


Shielding reduces hits by a factor of 20 in the VTX
 with **~50 %** less recorded hits in the full detector.

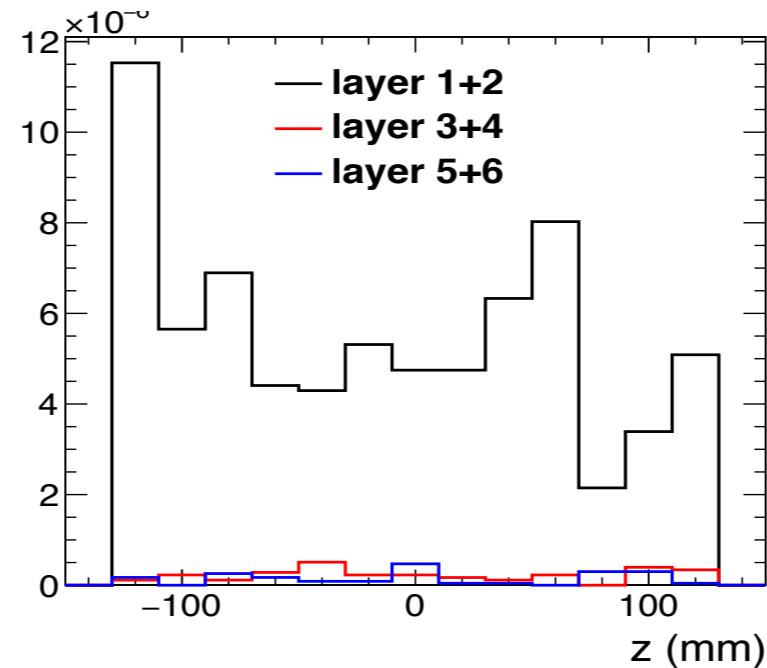
Partial removal of shielding to fit LumiCal also reduces recorded hits by a **factor of 2**, however VTX hits are higher by a **factor of 7** compared to full shielding (Factor of 3 better compared to no shielding).
 As expected no significant changes in the IT/OT.

Scaling up from numbers from Rome (E. Perez) in respect to **data volume**
 this still should not be an issue.

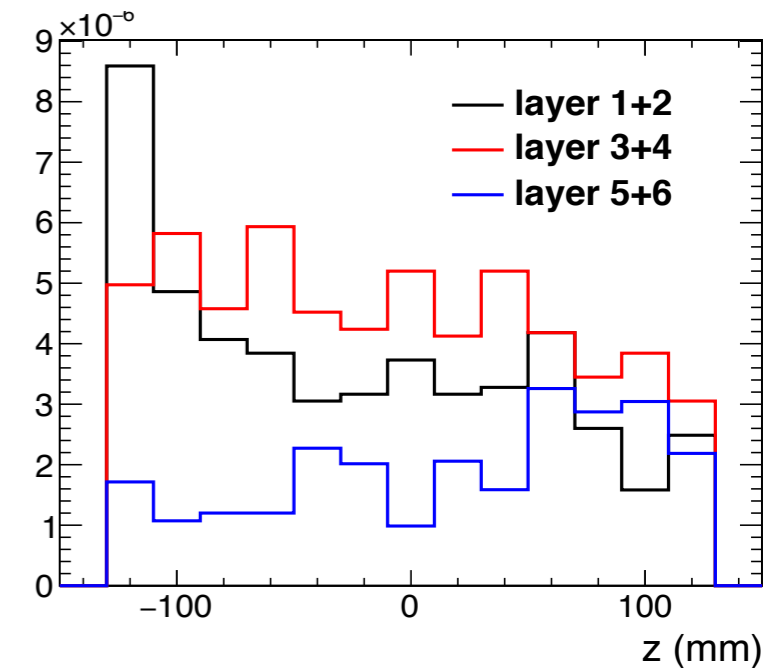
Full shielding



Partial shielding



No shielding



- Pixels $25 \times 25 \mu\text{m}$
- Full shielding significantly reduces occupancy in the vertex detector ($\sim 10^{-6}$)
- Partial shielding occupancy increases 10 fold in the 1st double layer
- Still within acceptable limits

Next steps:

- Look at occupancies on other detector parts, particularly IT/OT endcaps
- Further understanding of the origin of the hits
- New SR photon files from Mike Sullivan

