New GDML model of IP and SVT L0

Riccardo Cenci
University of Maryland

SuperB General Meeting, Pasadena, CA

December 14th, 2010

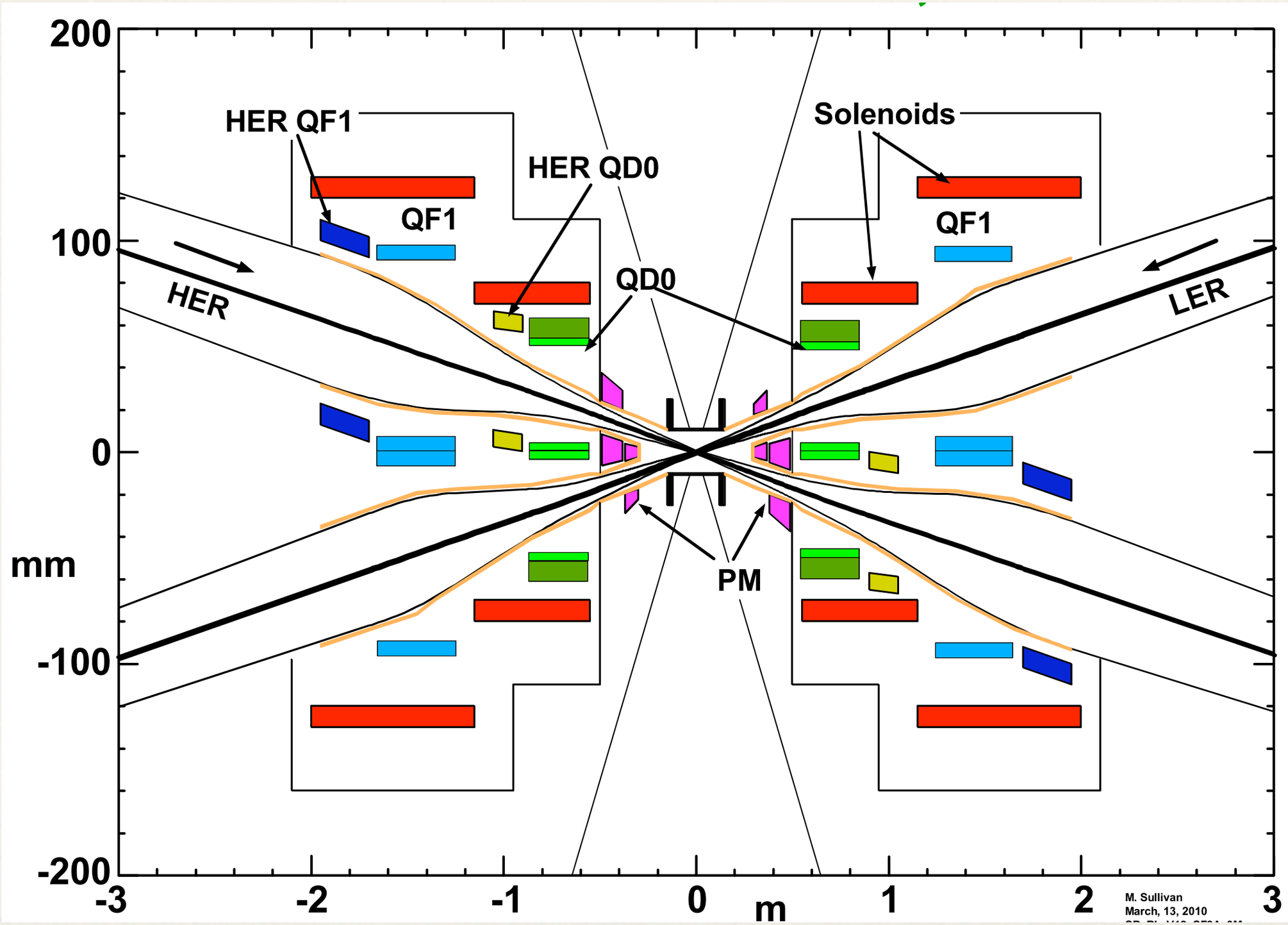
Previous status

- The SuperB geometry is implemented in Bruno through GDML description
  - Pro: easy to change without recompile
  - Cons: scripting is not flexible as C++, complex volumes partially generated without warning and have visualization problems
- Previous geometry was simple:
  - Cylindric beam pipe, solid beryllium
  - Stainless steel split pipes and following
  - Bulky tungsten shield
  - No cooling, flanges, bellows or support structure
  - Cylindric Svt L0 w/o cooling or HDI

New geometry

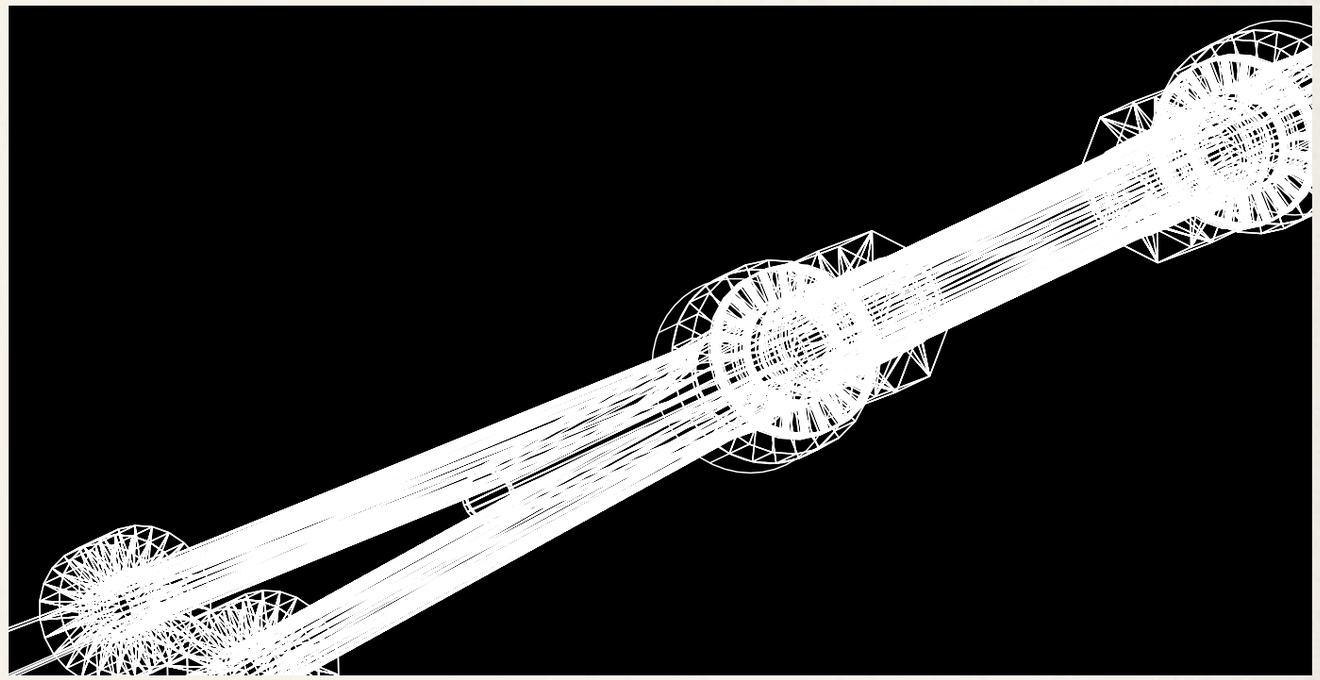
- Realistic structure around the IP from Filippo B. and Mike S. designs
  - Beryllium beam pipe with cooling and support structure
  - Steel pipes with bellows and flanges until ±86 cm on z axis
    - Pipes extended further down not according the design
- Pinwheeled L0 with cooling, HDIs and support
- Tungsten shield closest to the IP (beaks) has been removed to allocate cooling and support structure

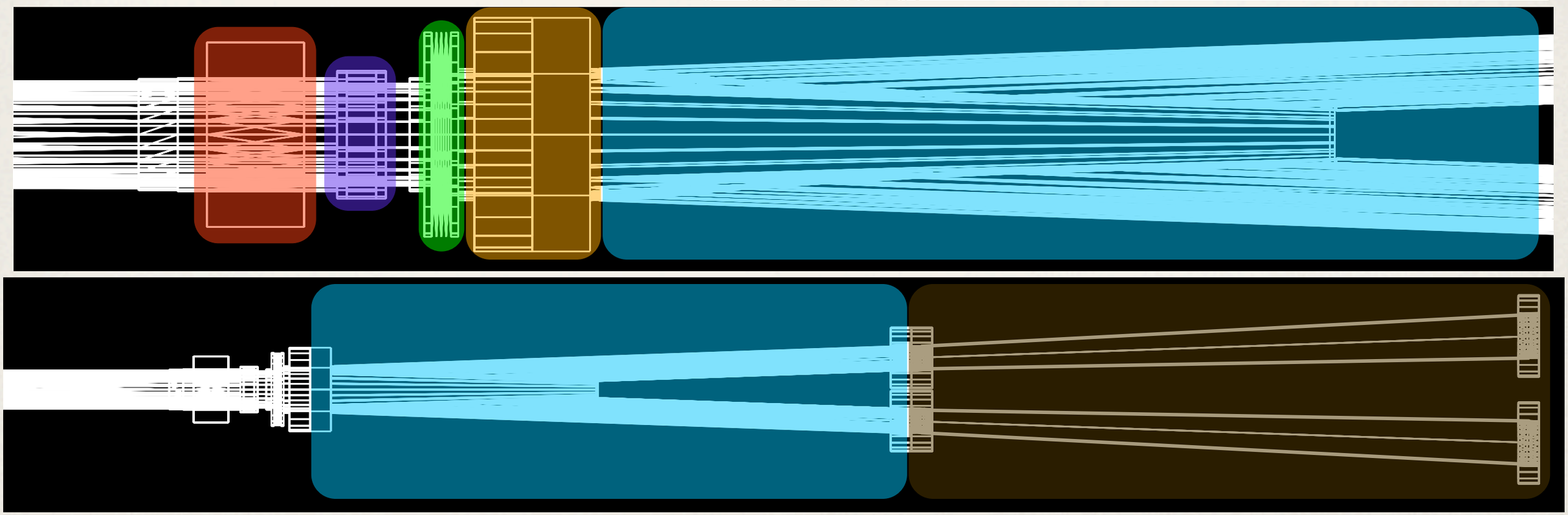
Mike S. design (Frascati Sep 10)



New geometry around IP (top view)

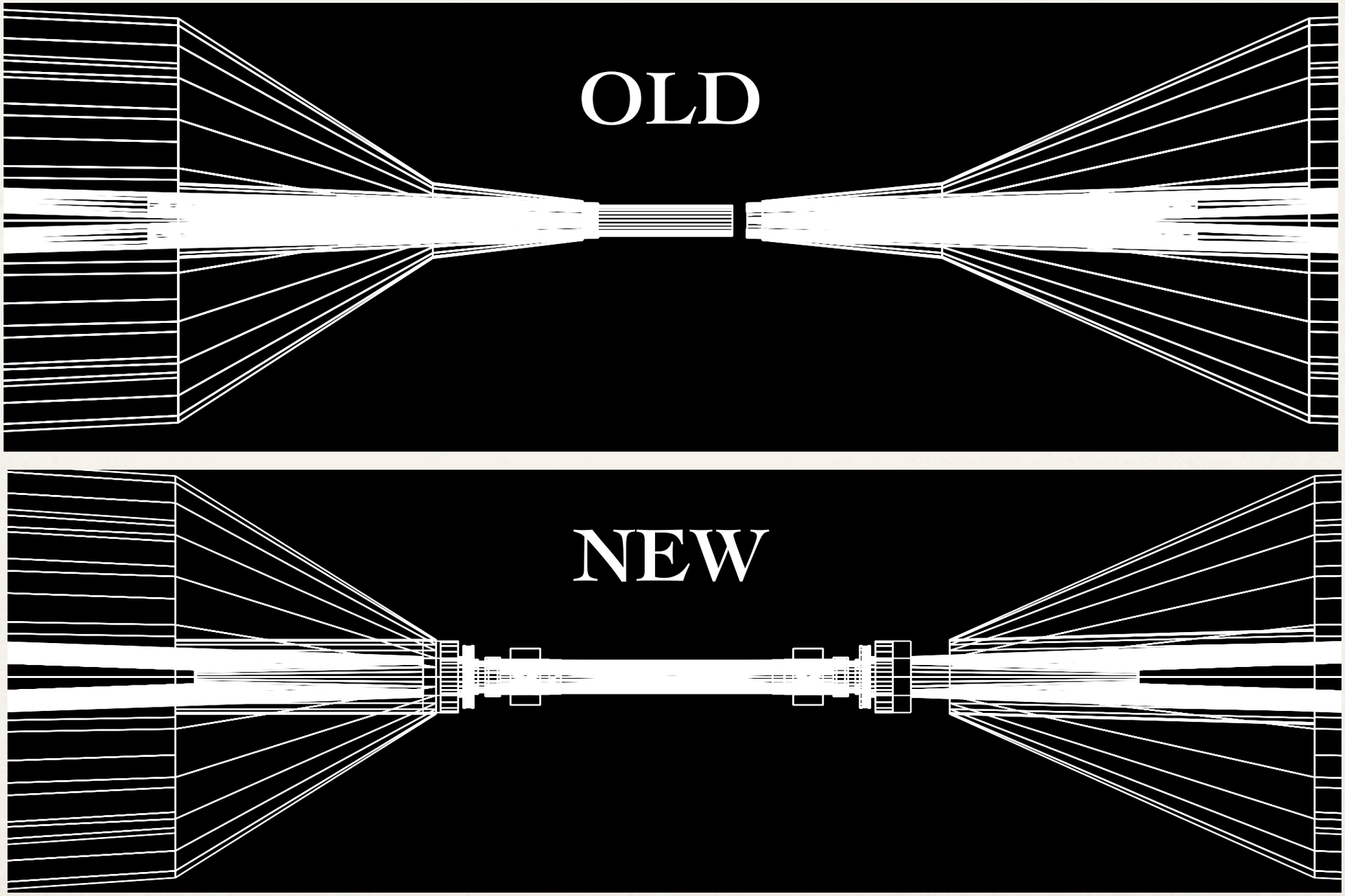
- L0 cooling manifold
- Beampipe manifold
- Bellow
- Flanges
- Split section
- LER/HER pipes



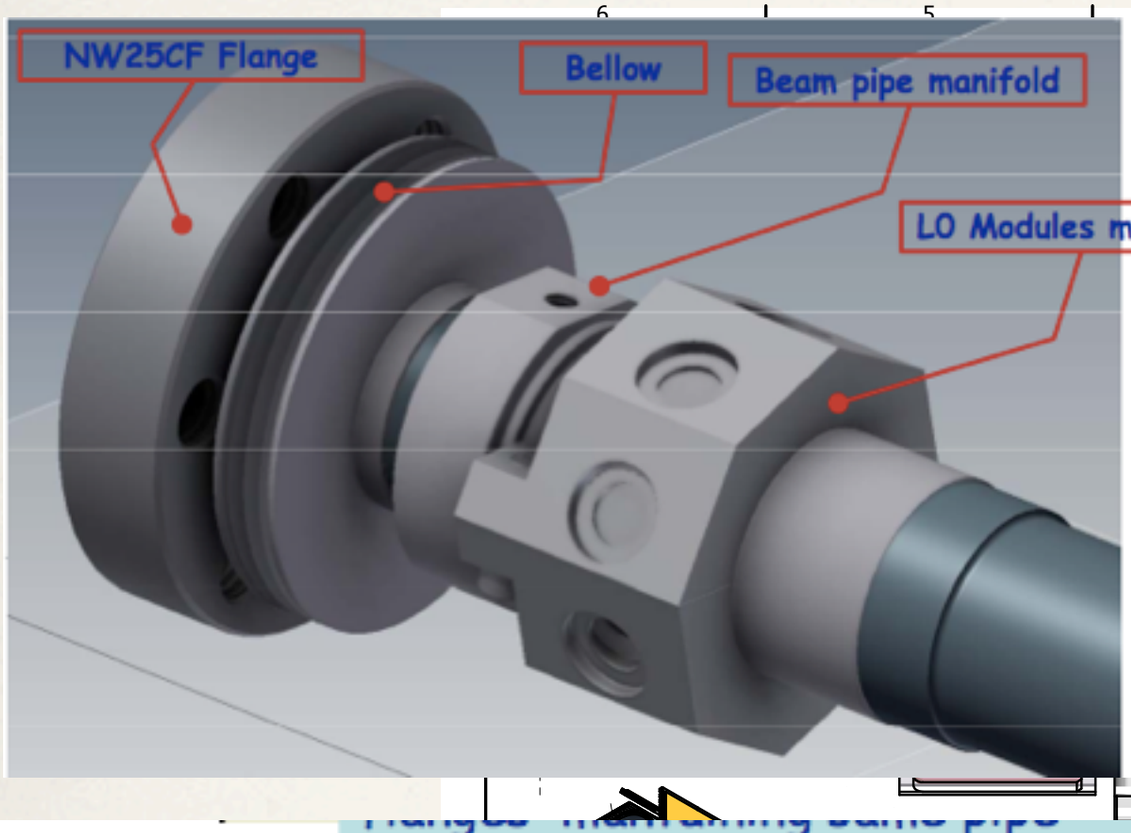


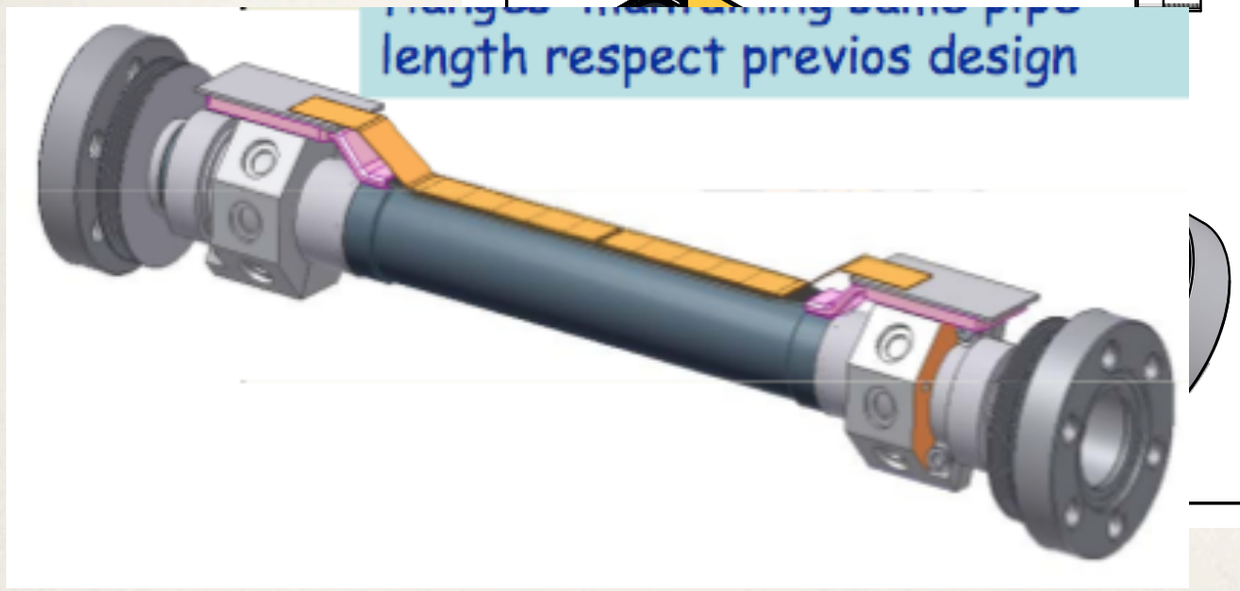
New geometry around IP (top view)

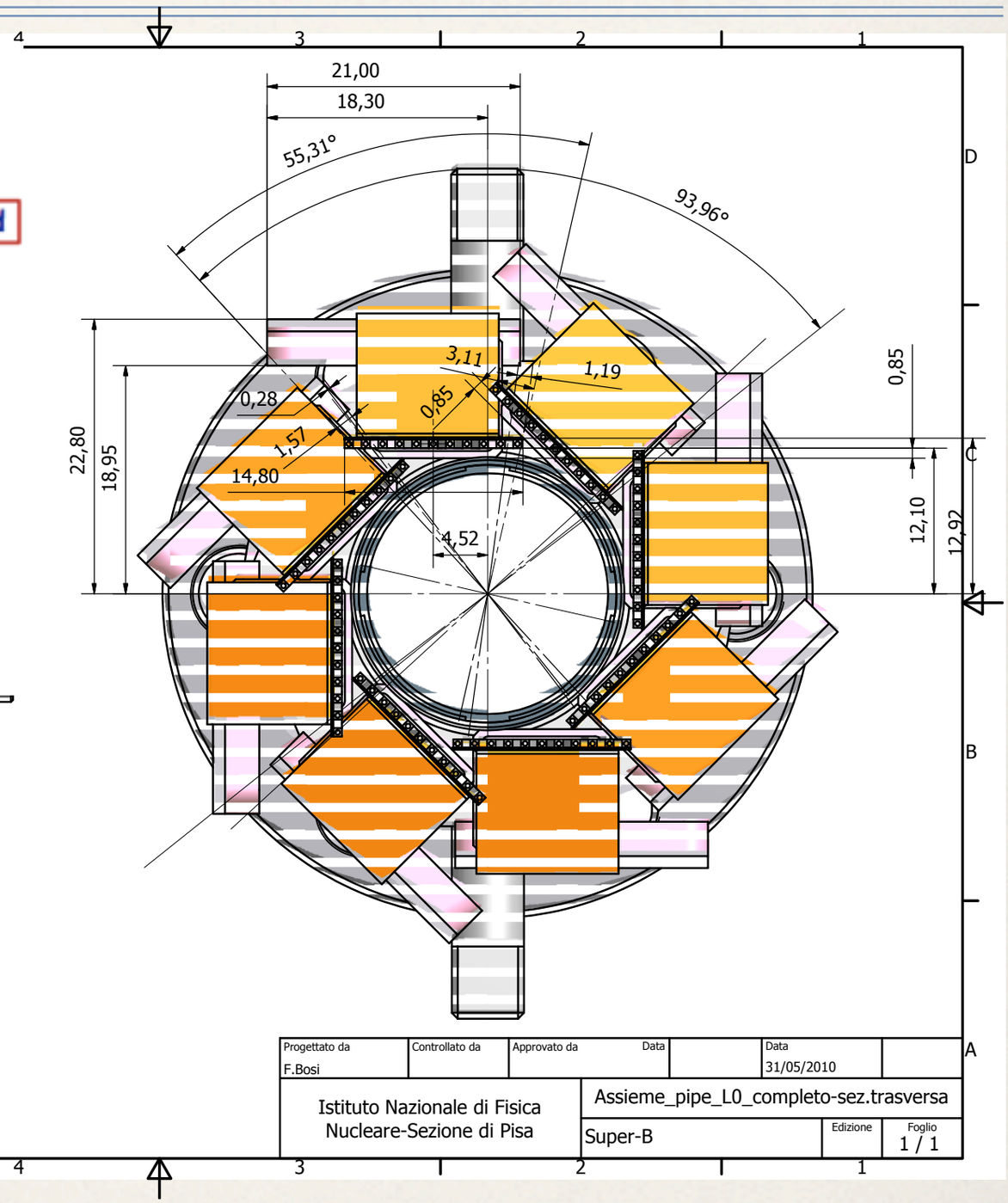
- Reduced tungsten shielding (beaks removed)



Filippo Bosi design

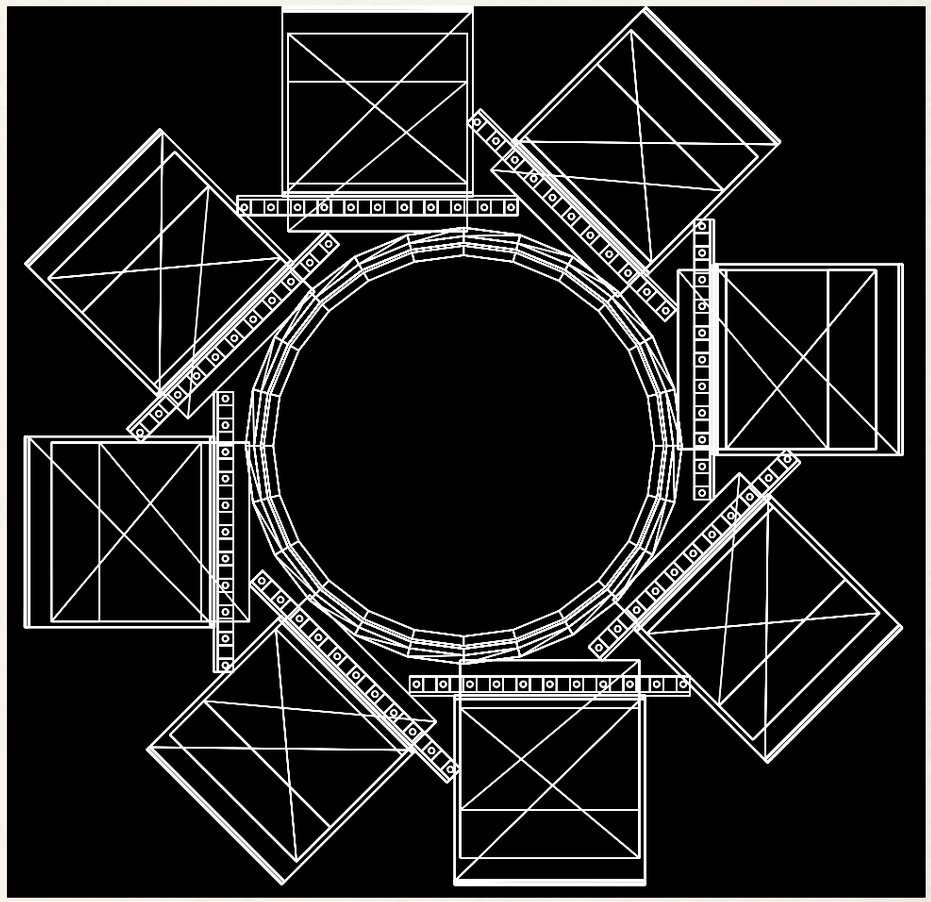






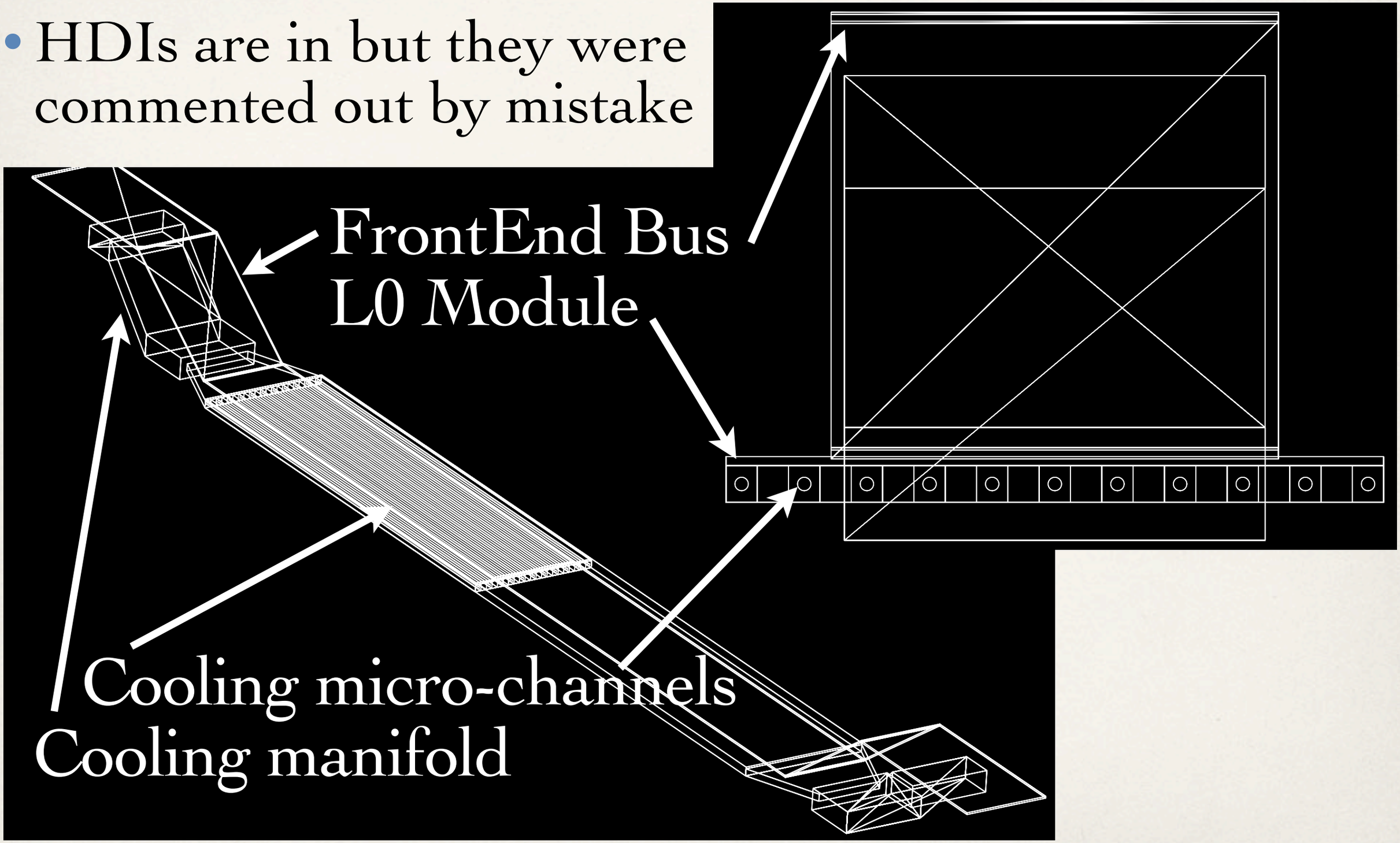
New geometry around IP

- Pinwheeled L0
- Min radius 13 mm
- Hdi implemented but missing in the committed geometry due to a mistake



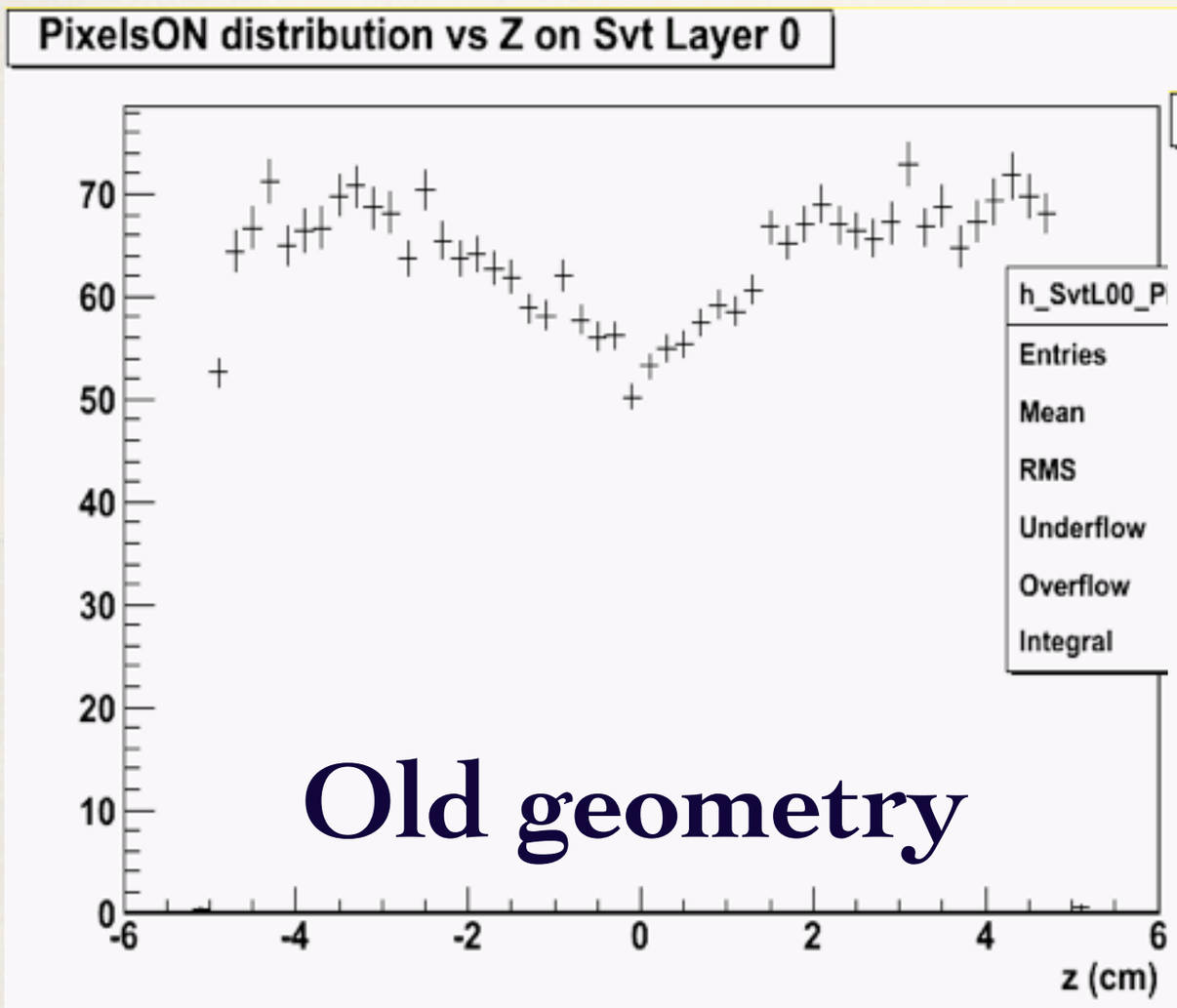
New geometry around IP

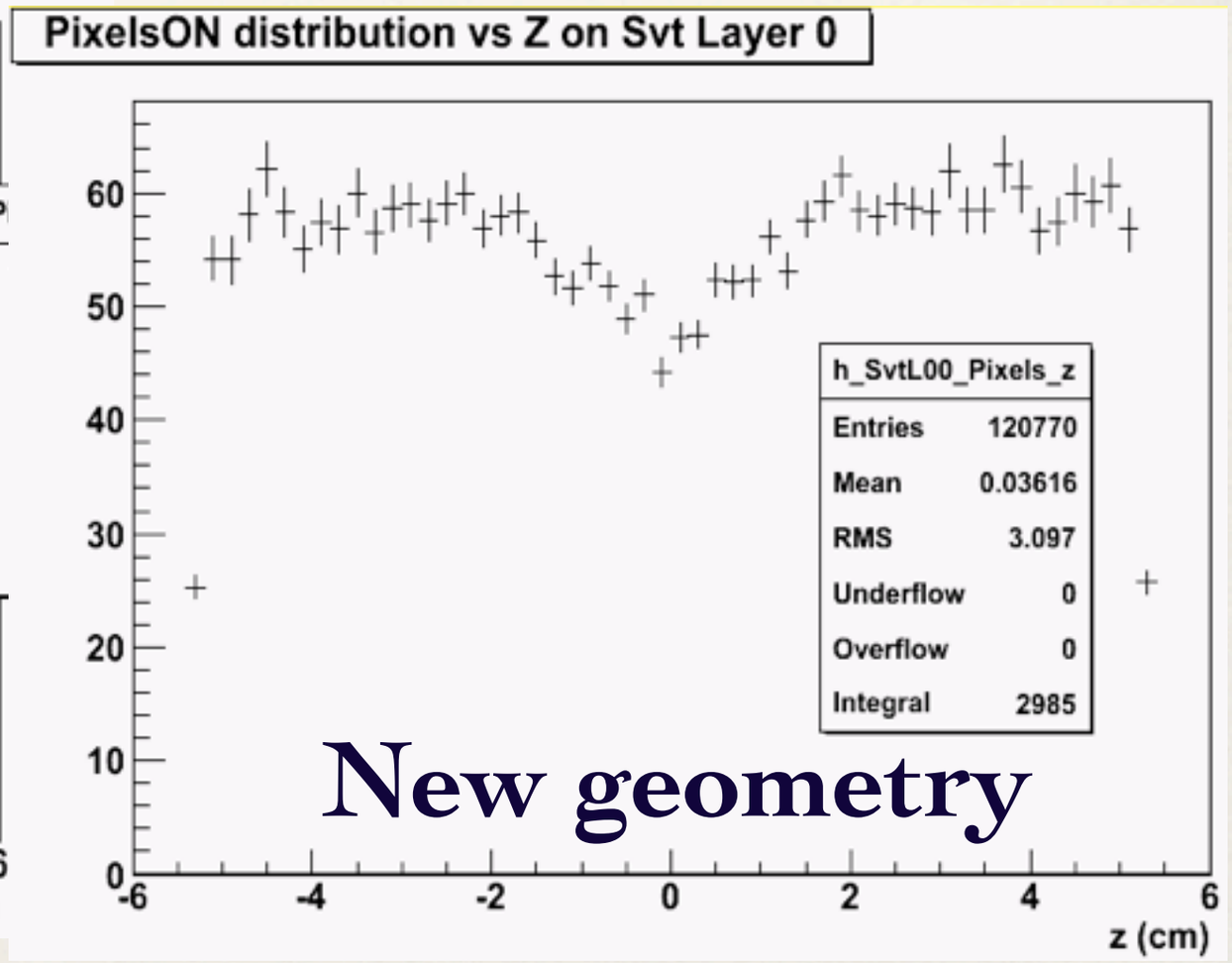
- HDIs are in but they were commented out by mistake



Background: SVT

- 2photon (aka pairs): rate is slightly decreased but still higher than requested, 56 MHz/cm2 (was 64)
- RadBhabha: decreased as well, 4.6 MHz/cm2 (was 5.4)





Background: DCH

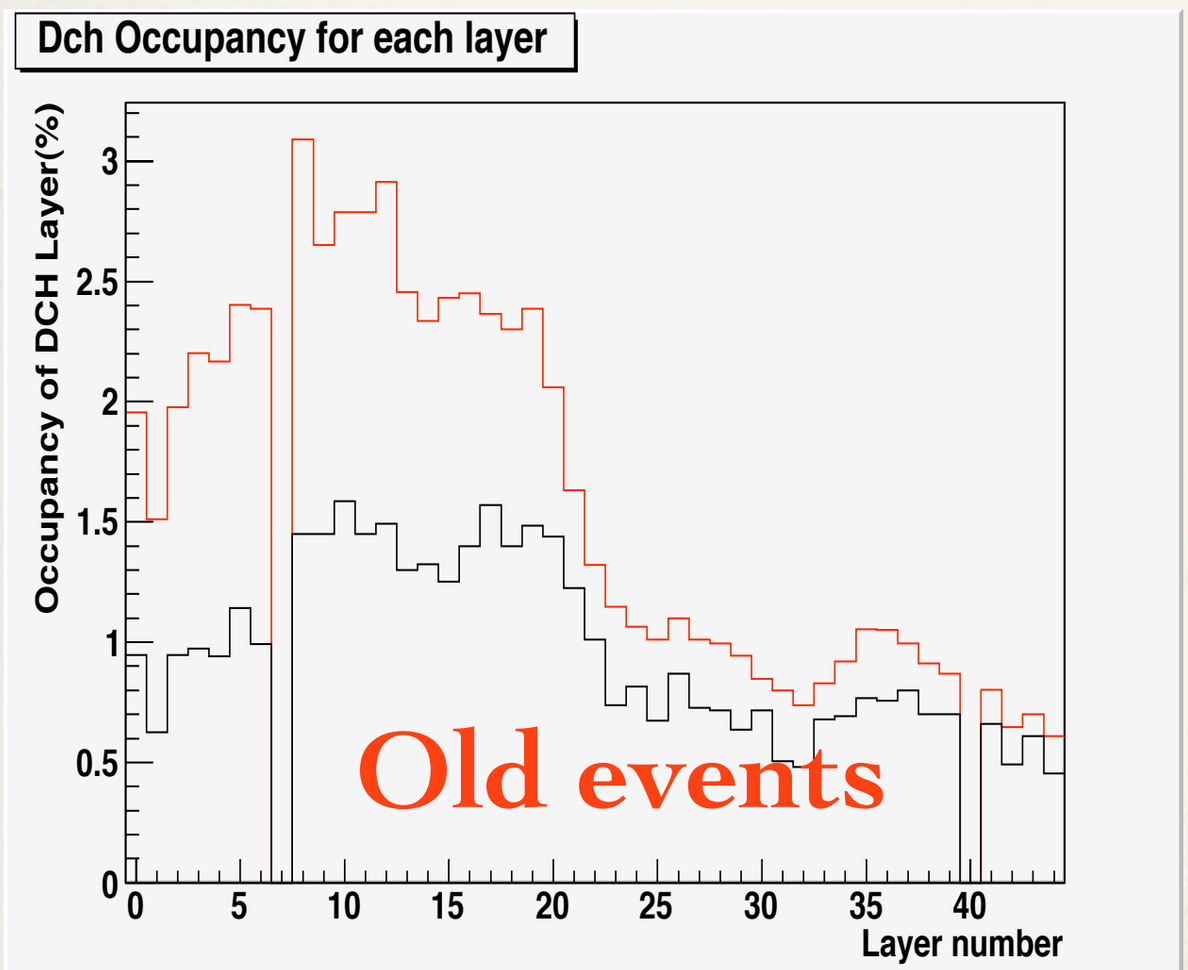
- Background study still under validation, results depend from simulation parameters, very preliminary
- 2photon (aka pairs): 1.5% -> 10.5% due to a lower cut on pT
- RadBhabha: 5% -> 20%, to be validated

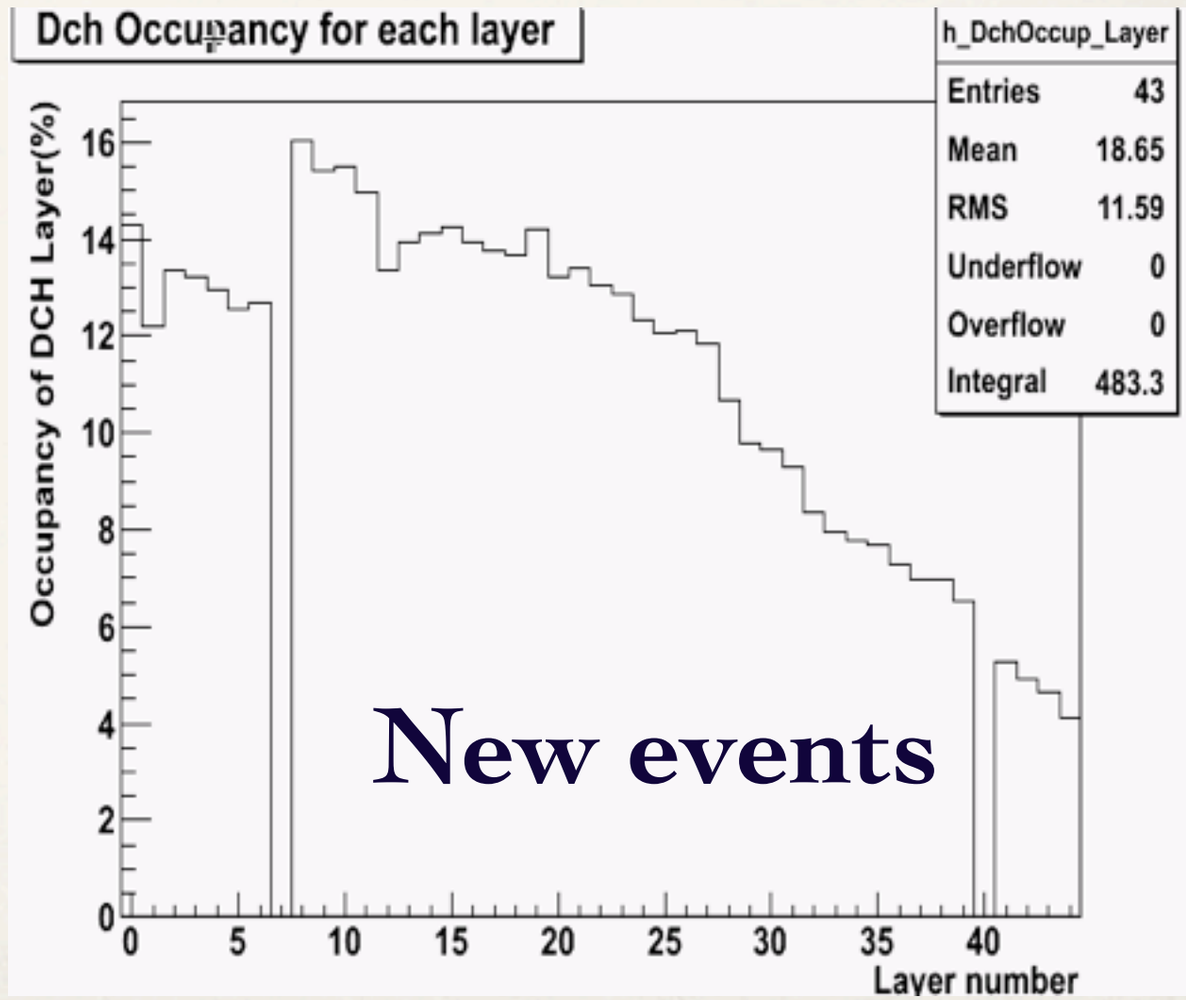
Conclusions

- Implementation of the new geometry according to the last designs
- Missing pieces, like magnets (currently only QD0's are in)
- Small effect on SVT background, even lower bkg
- Big increase in occupancy for DCH, to be validated

Dch background: 2photon bkg

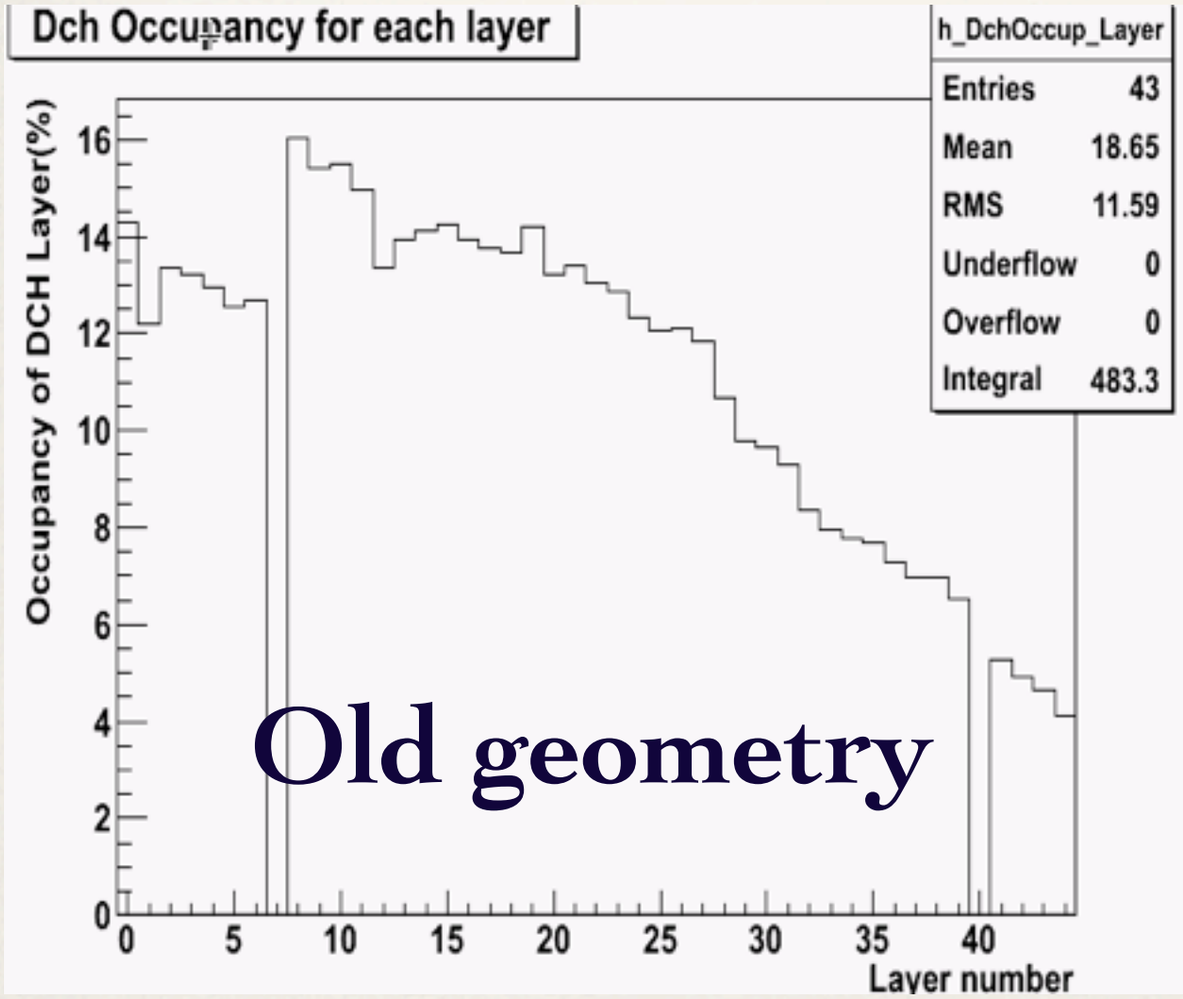
- Very preliminary results (and not validated method to calculate occupancy)
- New events, same geometry:
  - Much higher occupancy: 1.5% -> 10.5%
  - 2photon events now have lower pT cut

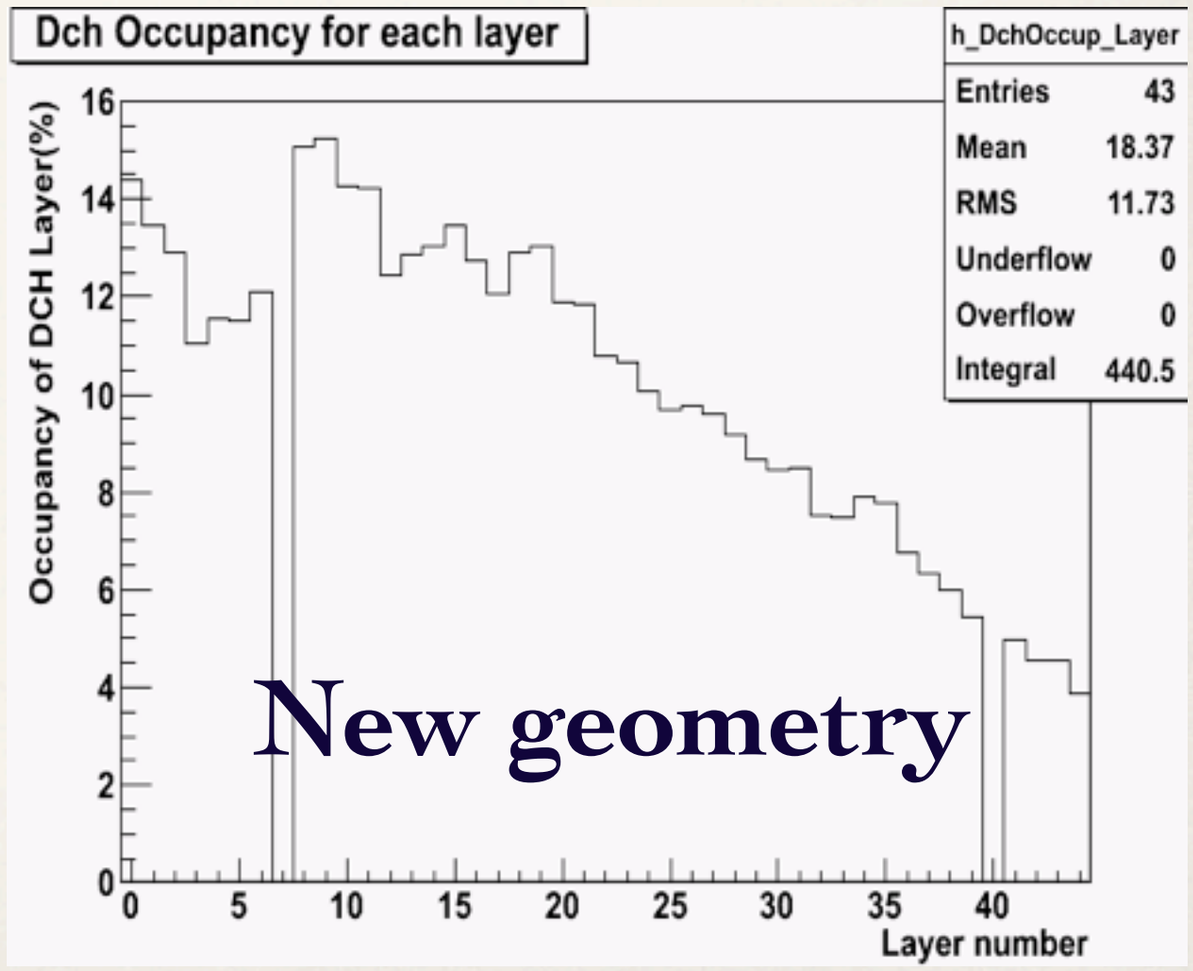
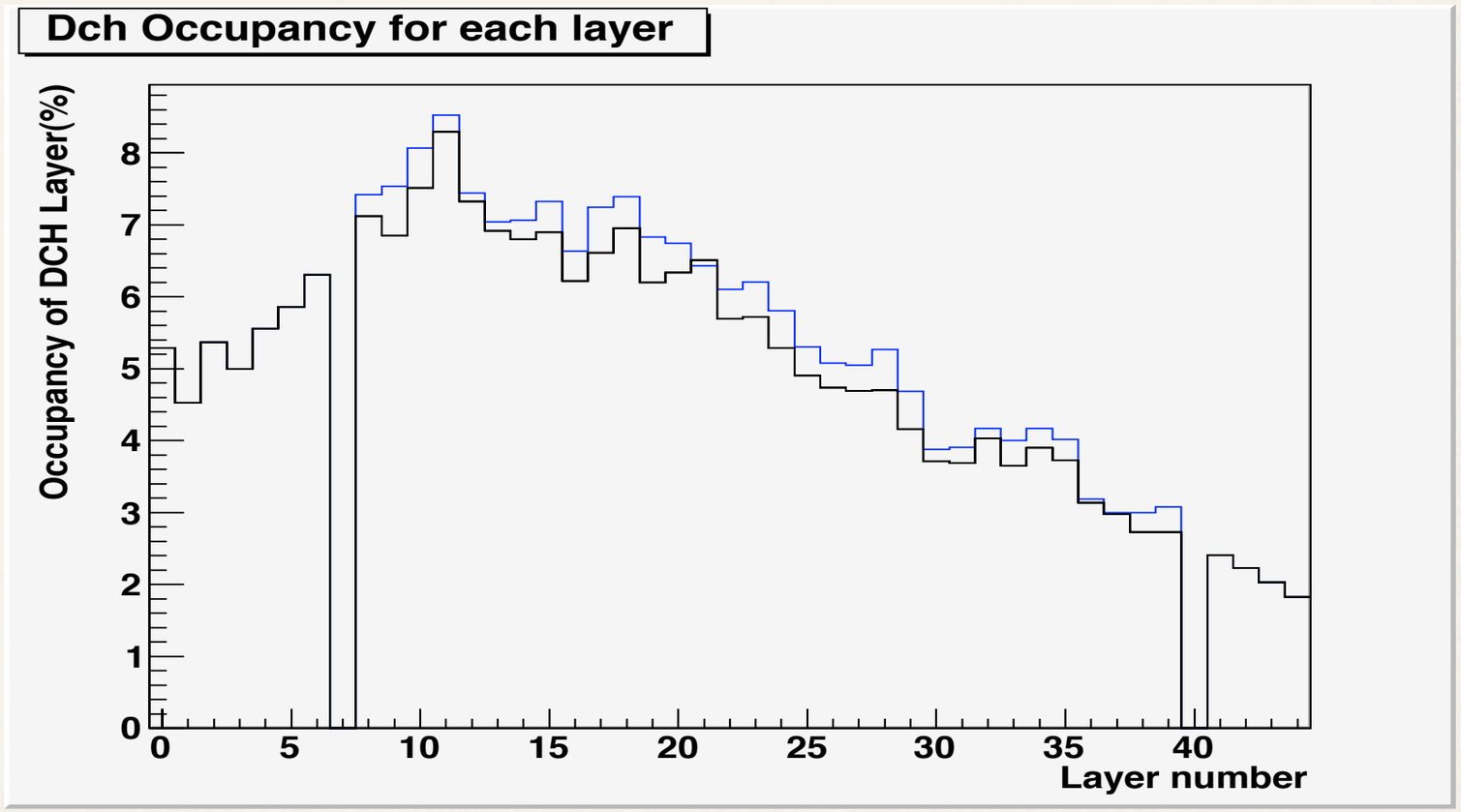




Dch background: 2photon bkg

- Very preliminary results (and not validated method to calculate occupancy)
- New geometry, occupancy 10.5% -> 9.6%





Dch background: RadBhabha bkg