Update on SVT Background simulation with Bruno

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Updates and issues

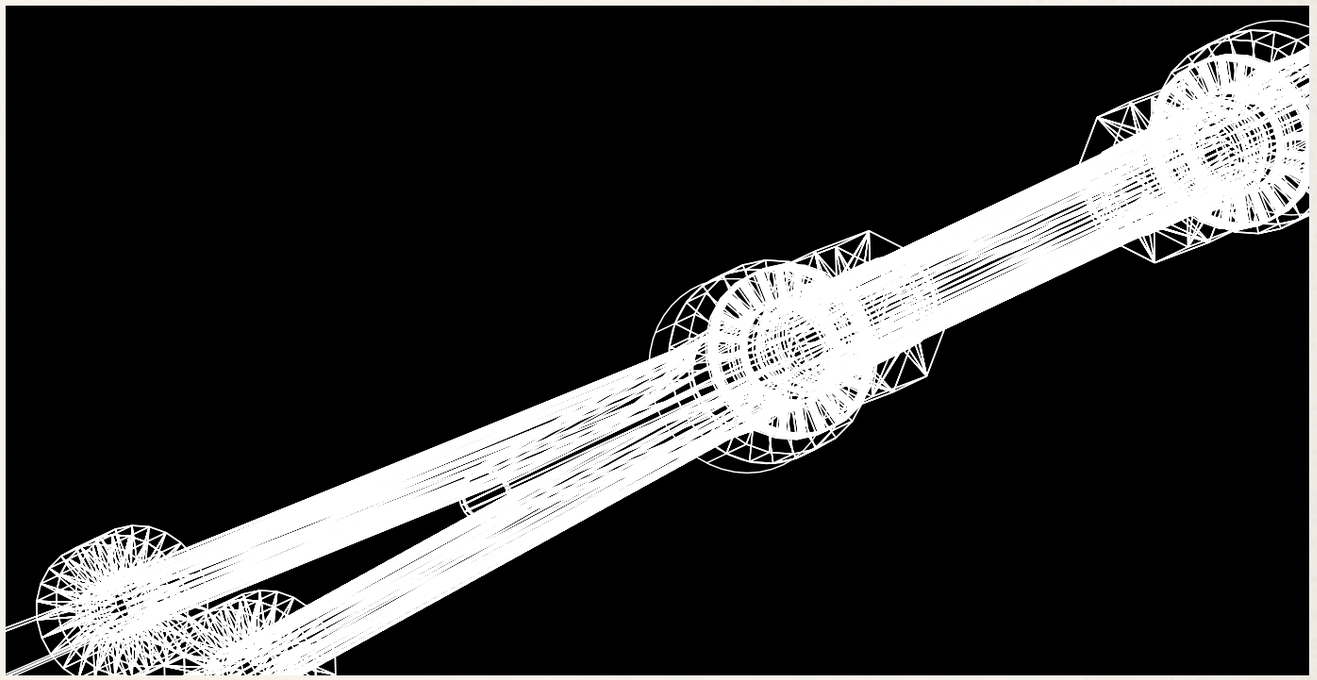
- New test productions:
  - 2Photon (aka Pairs): 260 us
    - New macro to produce those events automatically, not embedded in Bruno
      - Normalization is different: lower cut on pT, but no difference in L0 rate (those particle didn't make to it)
  - Rad Bhabha: 2.4 ms
    - Only with new geometry, no direct comparison with old results

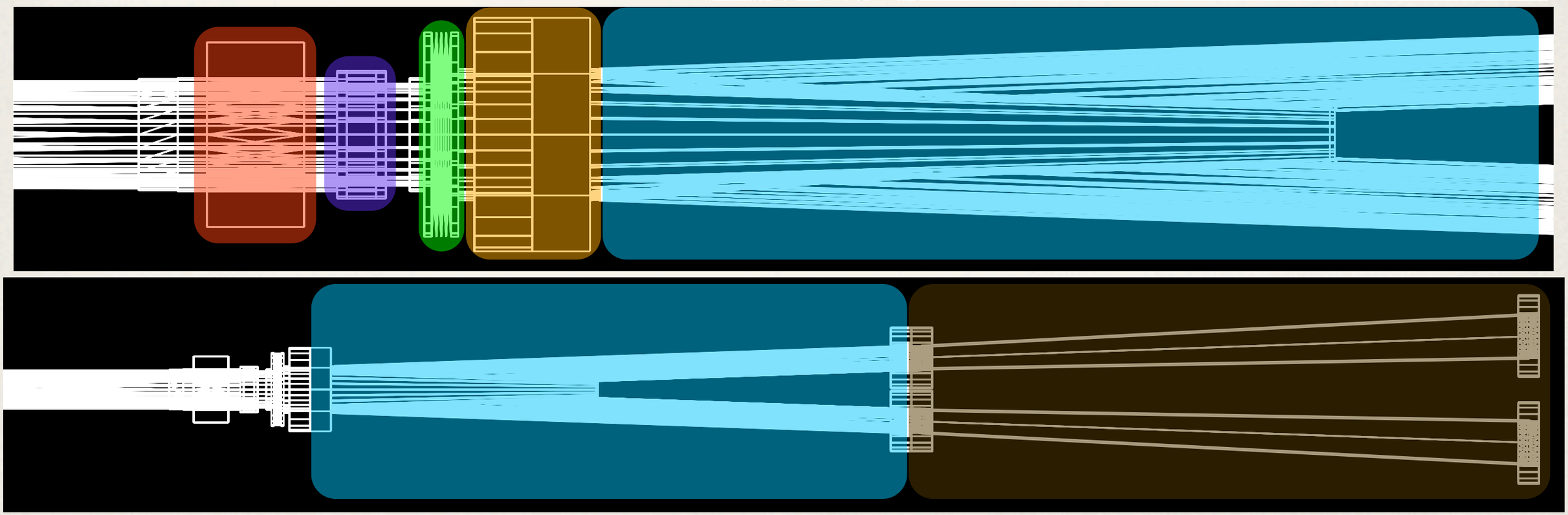
New geometry around IP

- Before: cylindrical beam pipe and L0, thick tungsten shield just outside the occupancy
- 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 simply extended few meters further, 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

New geometry around IP (top view)

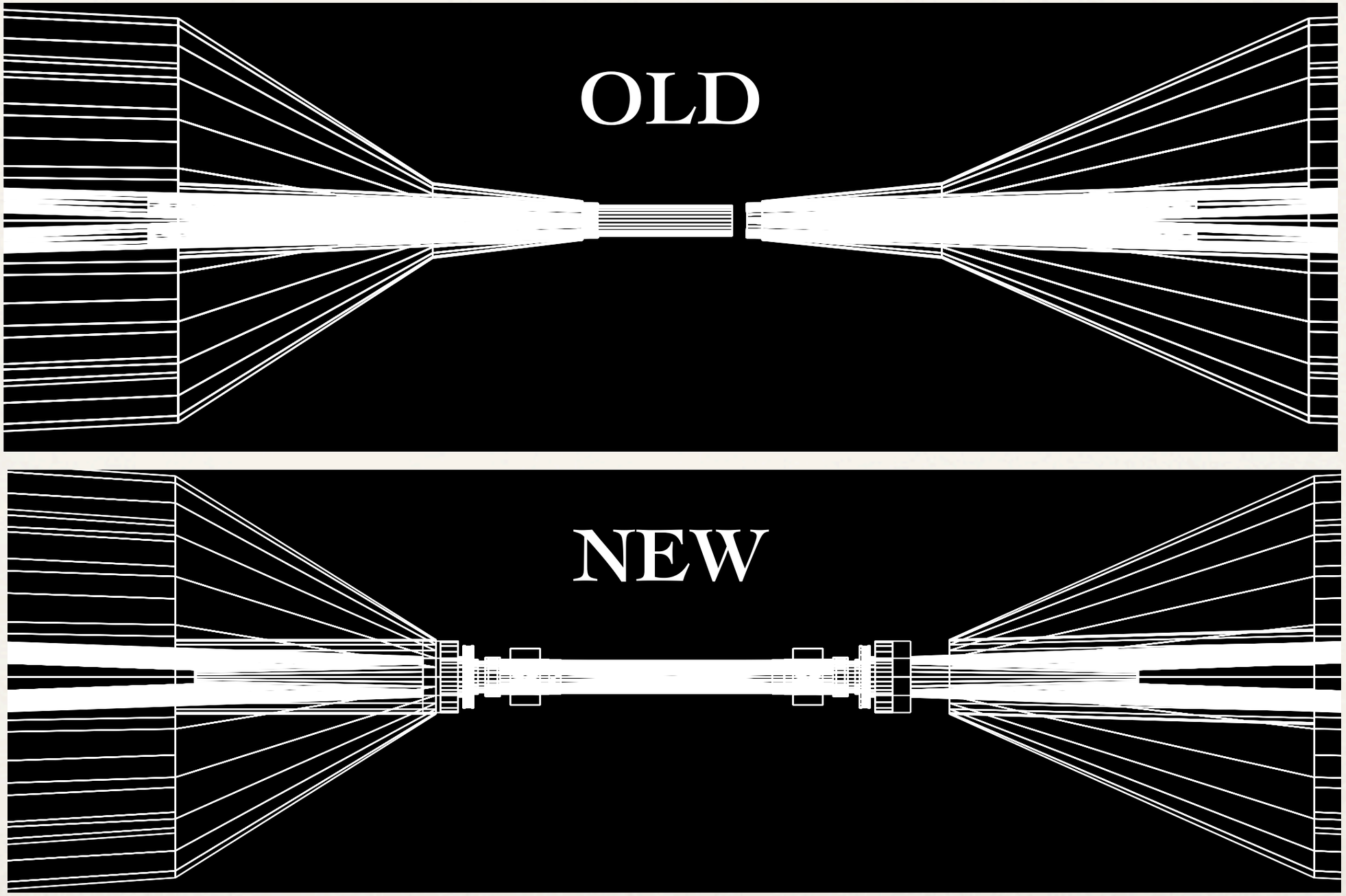
- L0 cooling manifold
- Beampipe manifold
- Bellow
- Flanges
- Split section
- LER/HER pipes





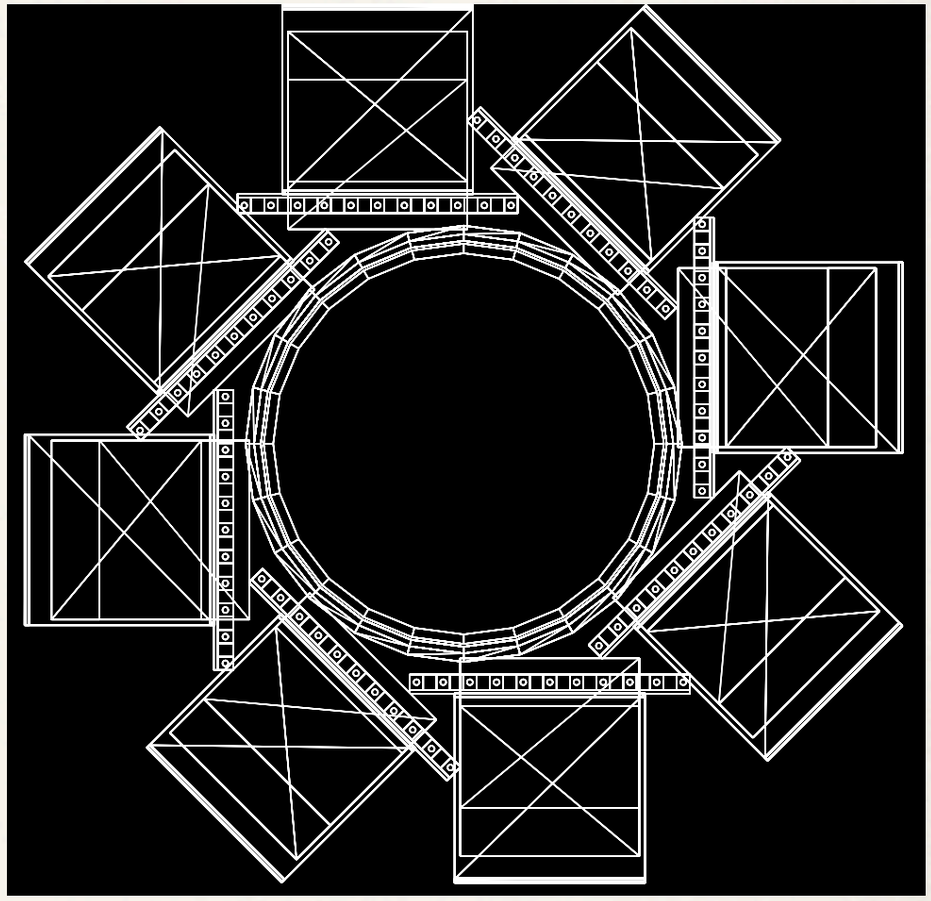
New geometry around IP (top view)

- Reduced tungsten shielding (beaks removed)



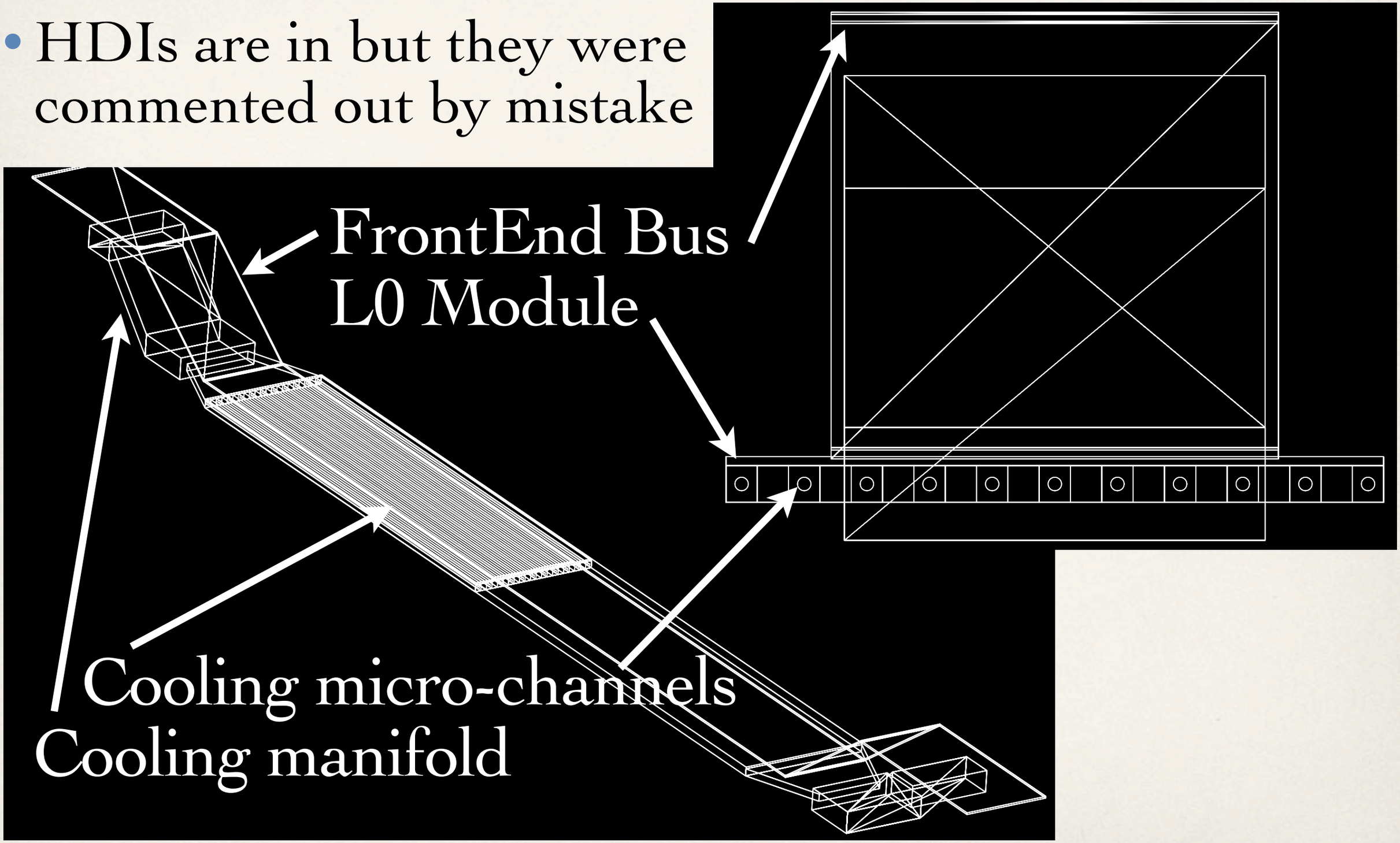
New geometry around IP

- Pinwheeled L0
- Min radius 13 mm
- Hdi implemented but missing in the committed geometry due to a mistake, no new estimation for HDI doses



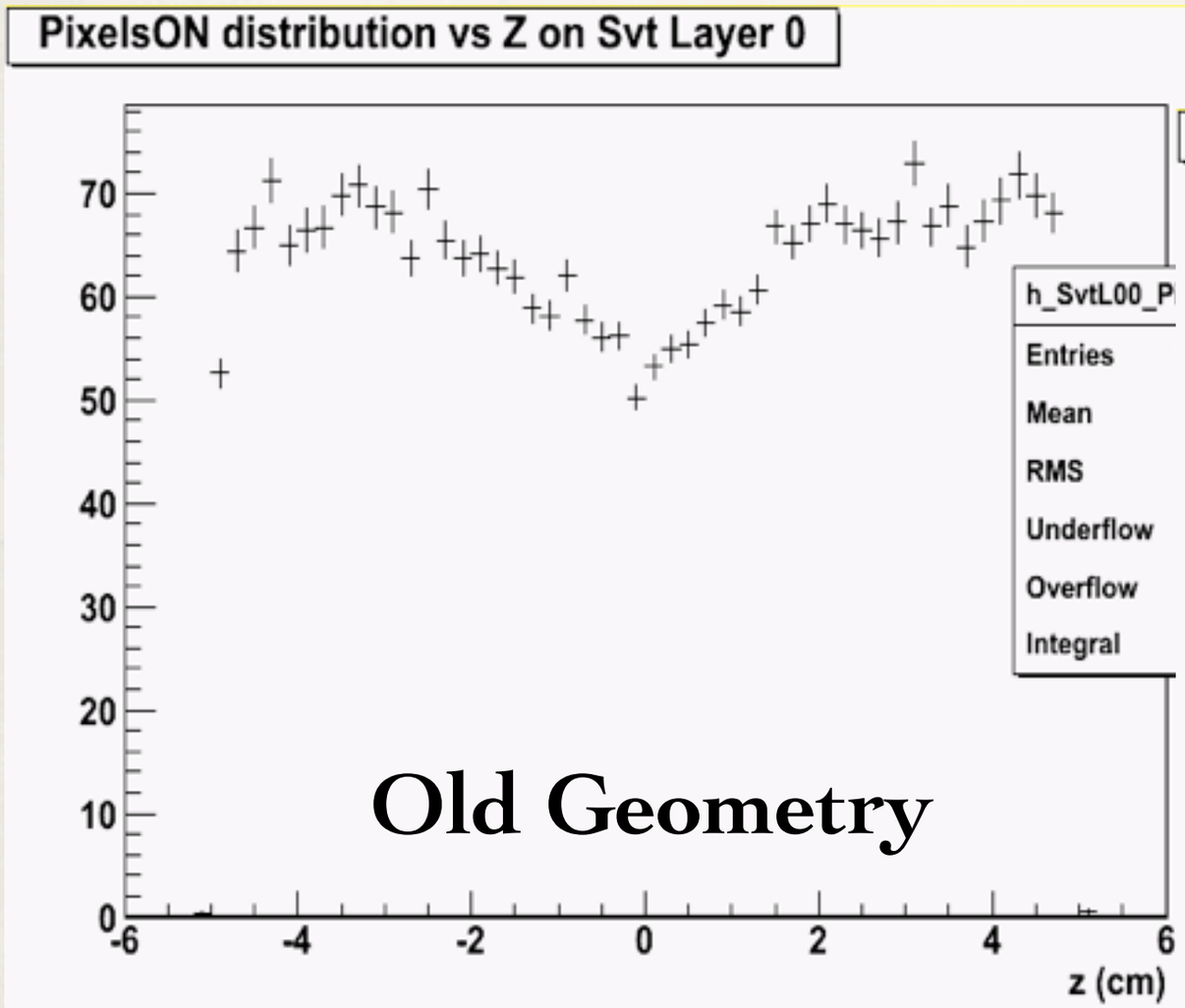
New geometry around IP

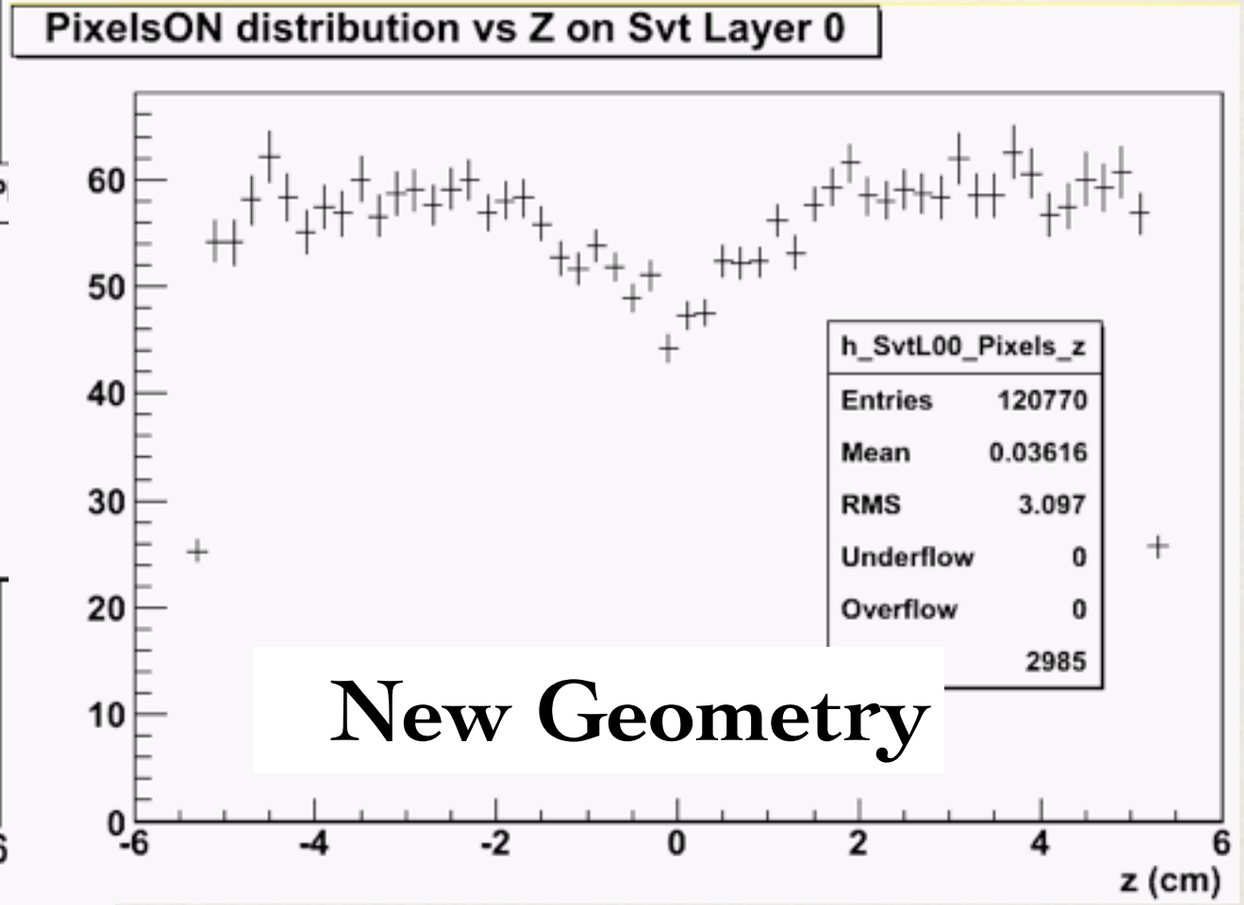
- HDIs are in but they were commented out by mistake



Background: 2photon (aka pairs)

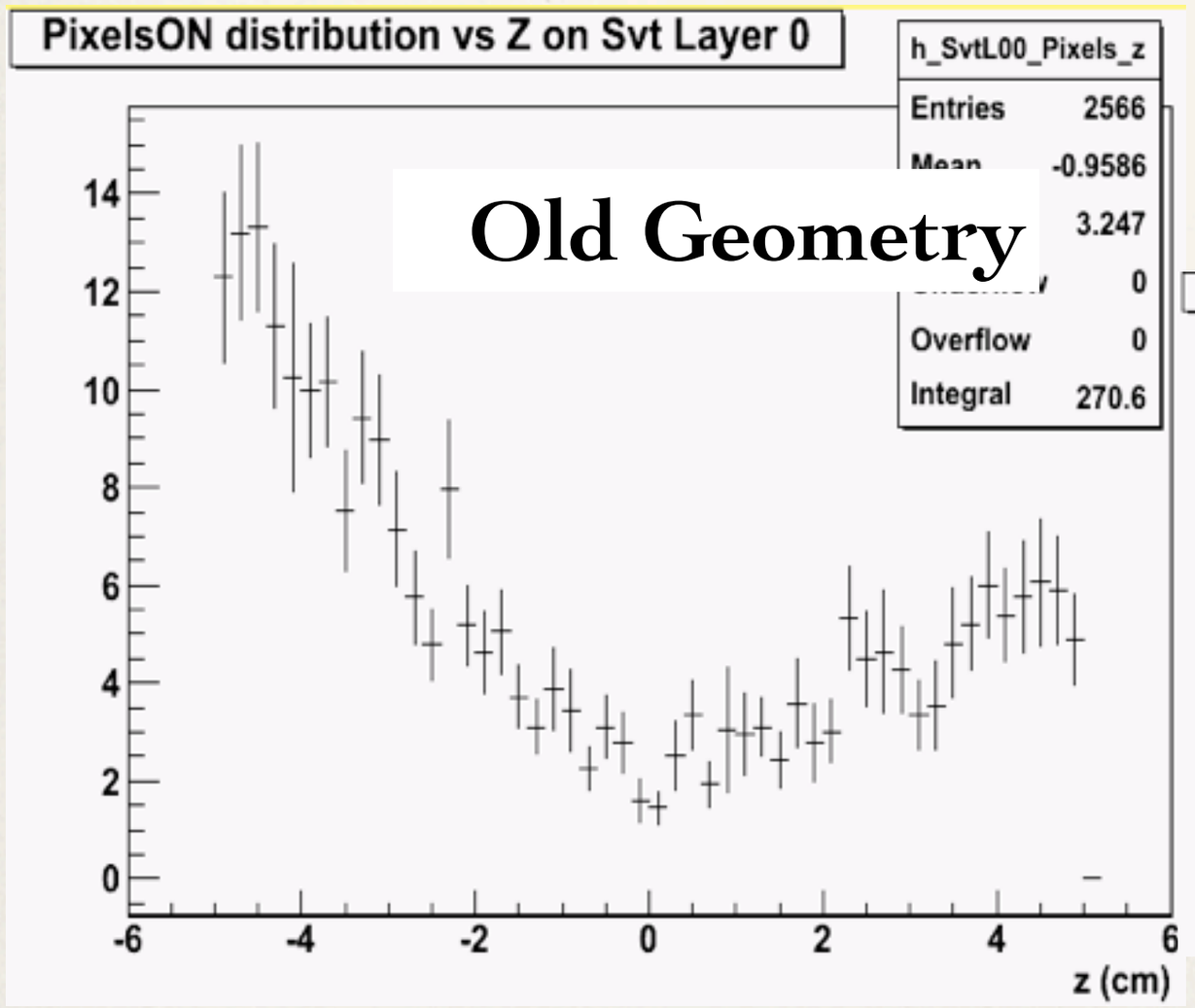
- Rate is slightly decreased but still higher than requested, 56 MHz/cm2 (was 64)
- Shape is the same

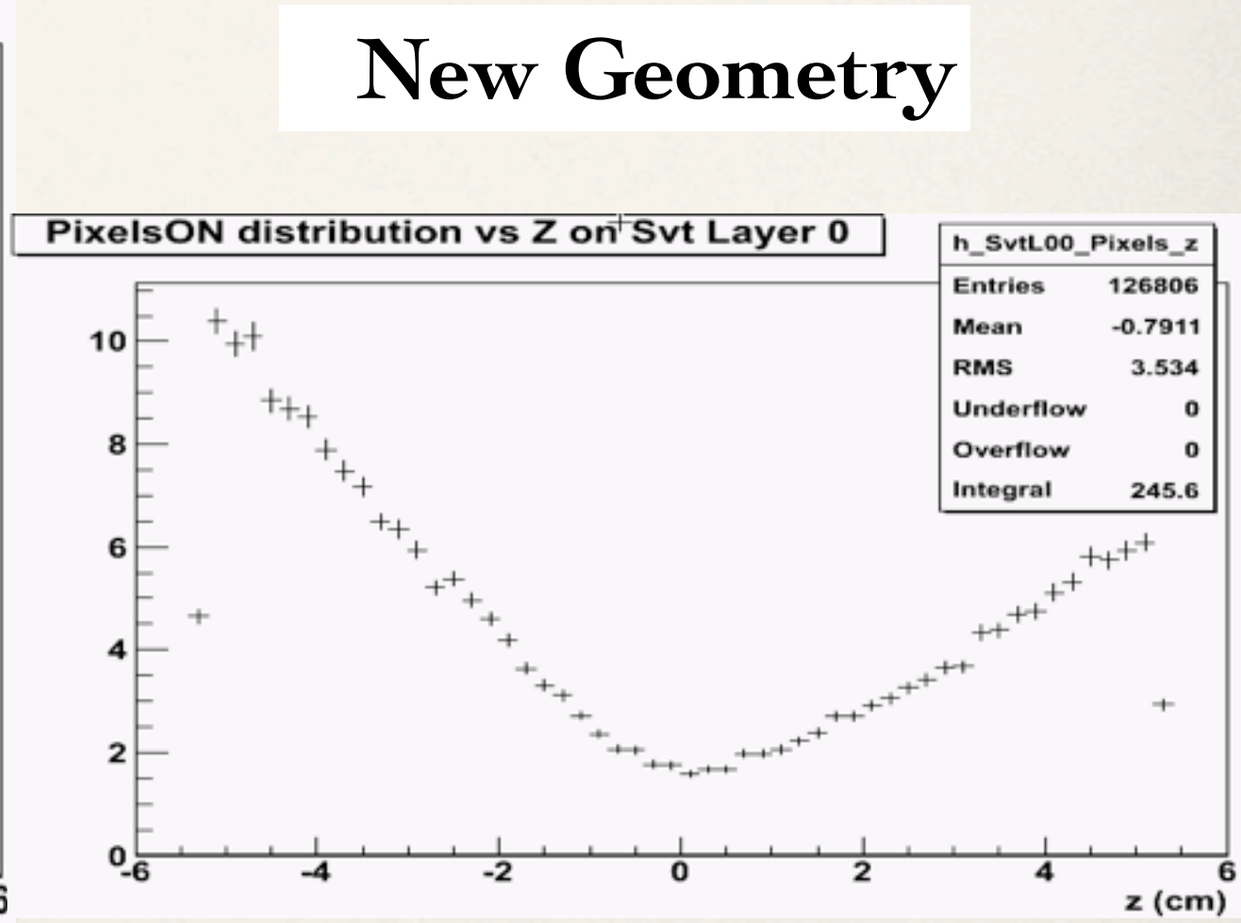




Background: RadBhabha (B Off)

- L0 rate decreased as well, 4.6 MHz/cm2 (was 5.4)
- Shape again is the same

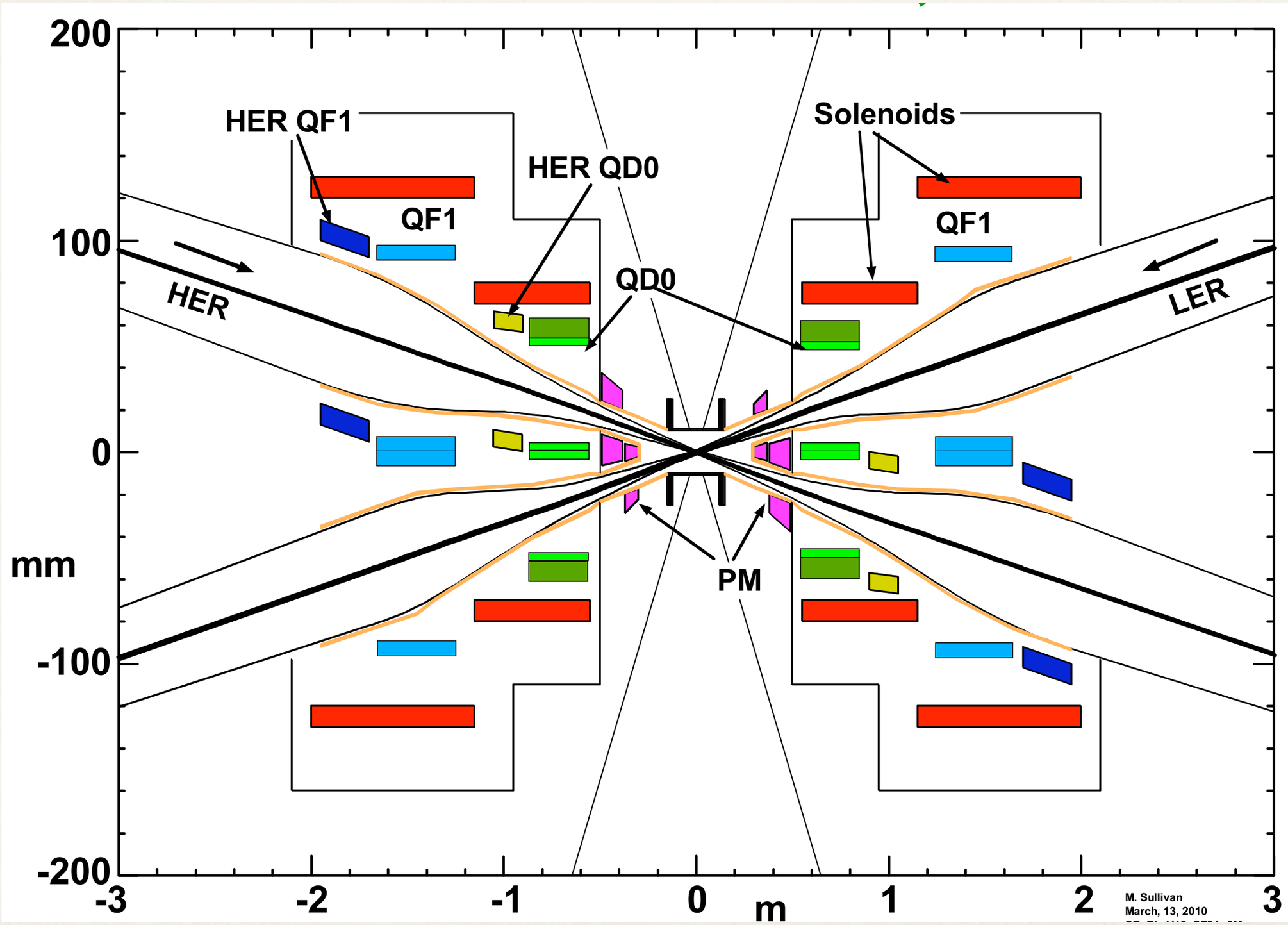
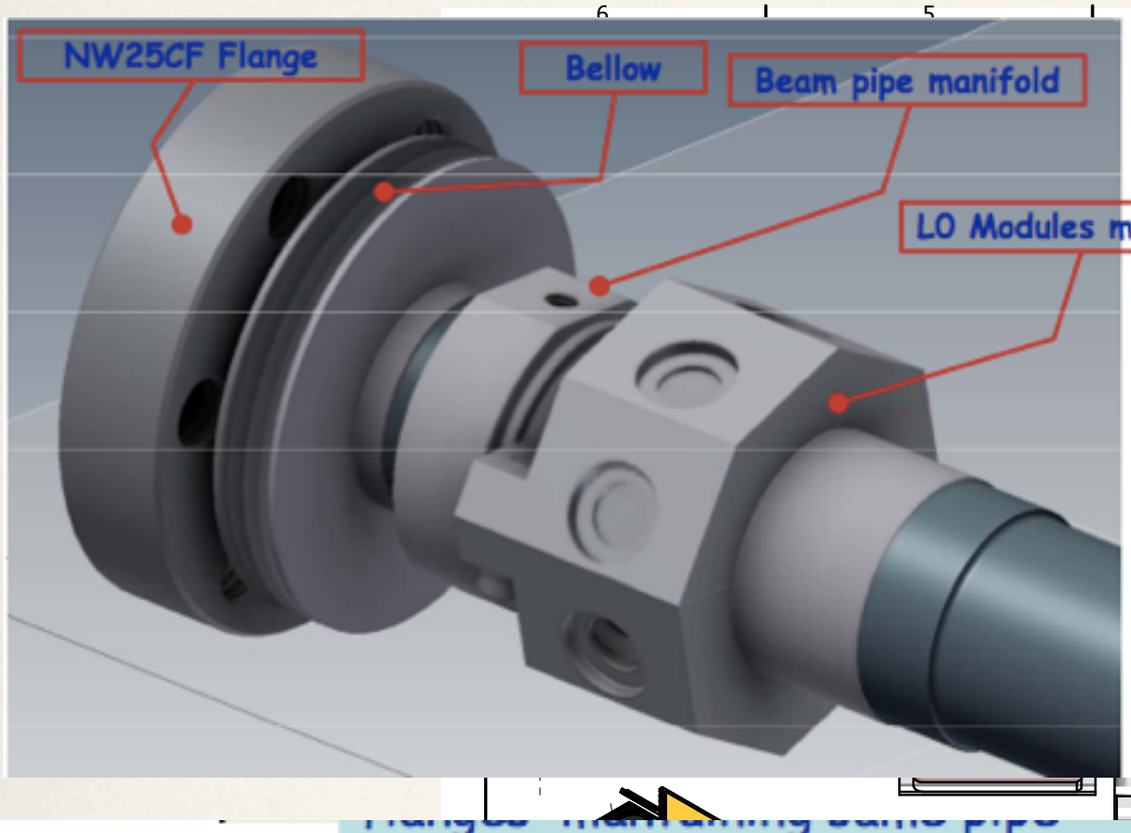
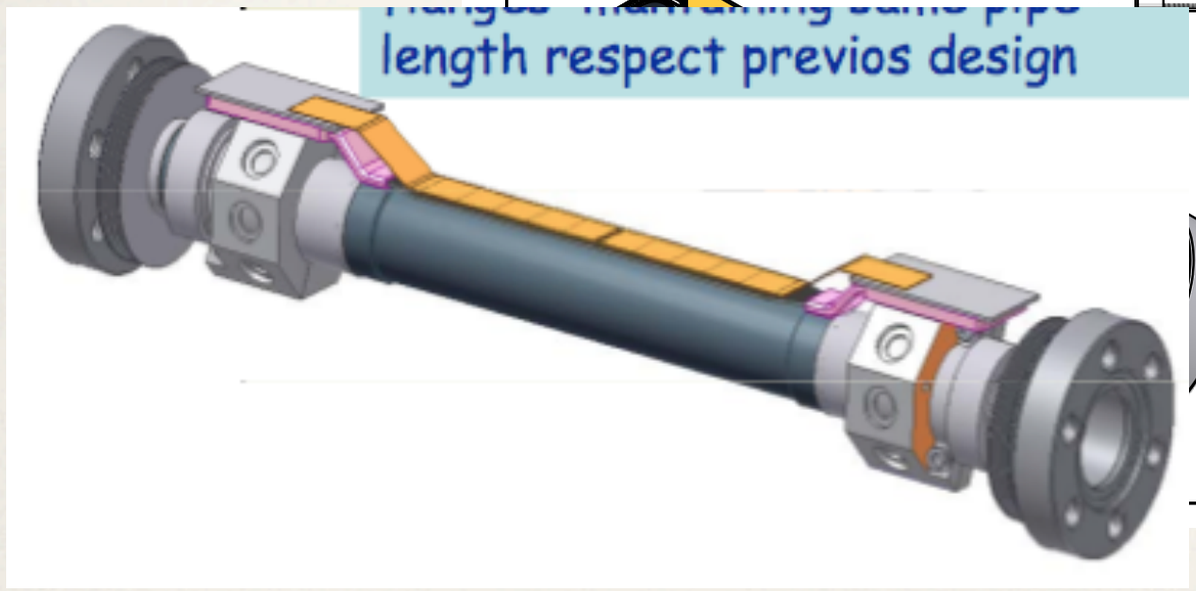
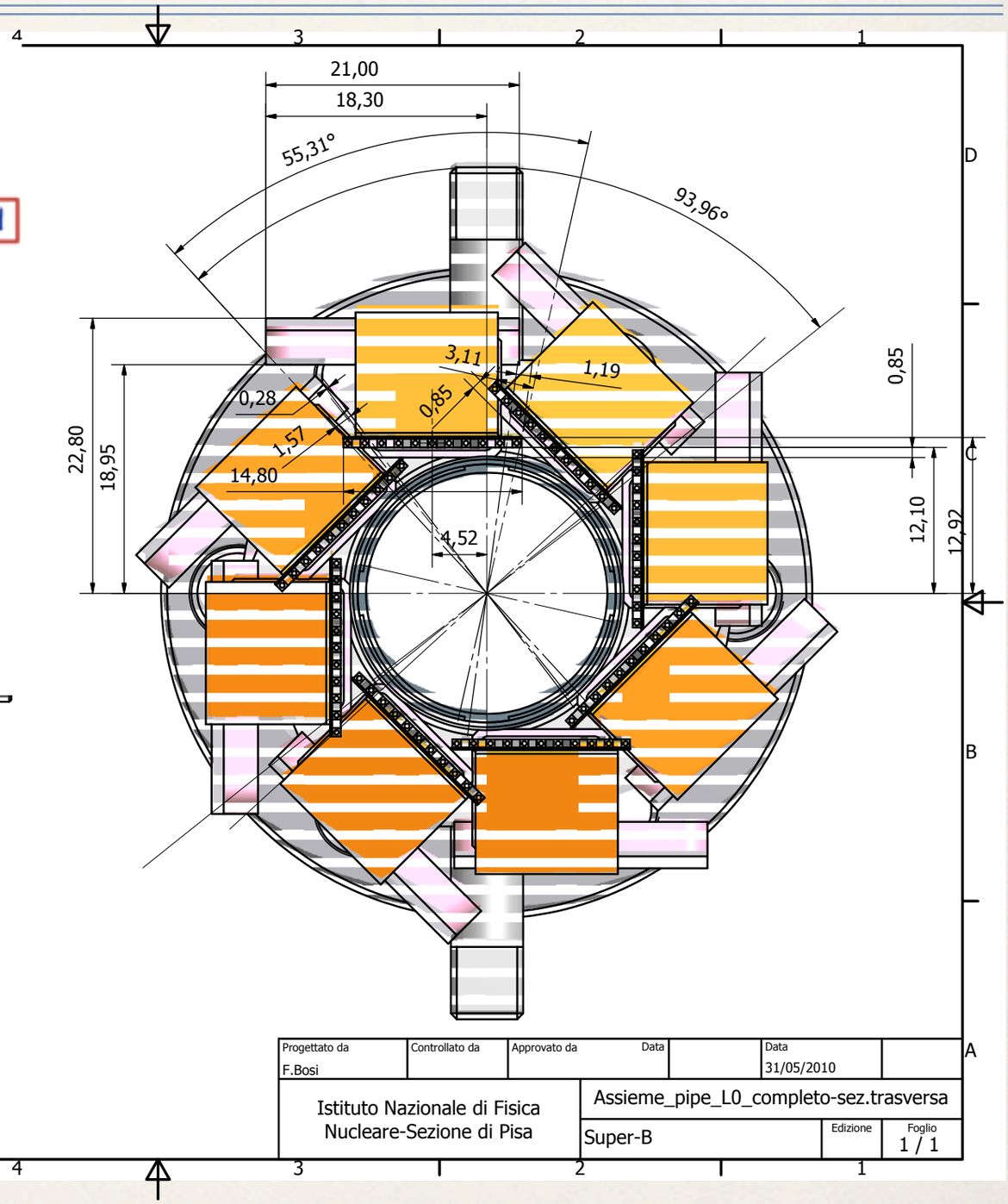




Conclusions

- Implemented new IP and L0 geometry, more realistic and close to present design
- Realistic design has not a big impact on L0 background
- RadBhabha statistics is enough, but more 2photons events are needed (now easy to produce)
- Background estimation for SVT is pretty stable and validated, now easy to test different configurations
- Missing new estimation for HDI doses

Mike S. design (Frascati Sep 10)



Filippo Bosi design