

Background meeting, Nov. 4th 2011

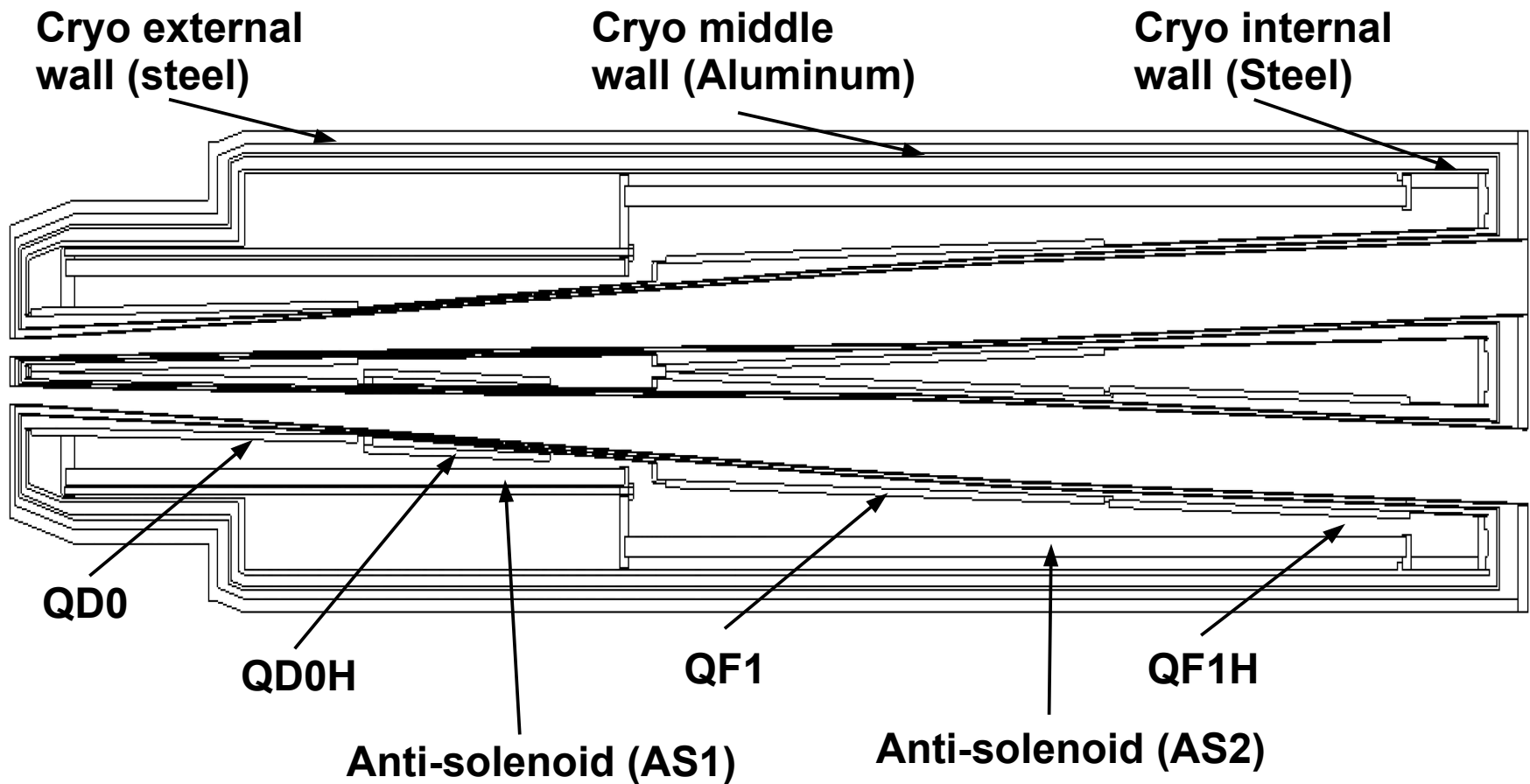
Cryostat and Magnets implementation

Alejandro Pérez
INFN – Sezione di Pisa

Outline

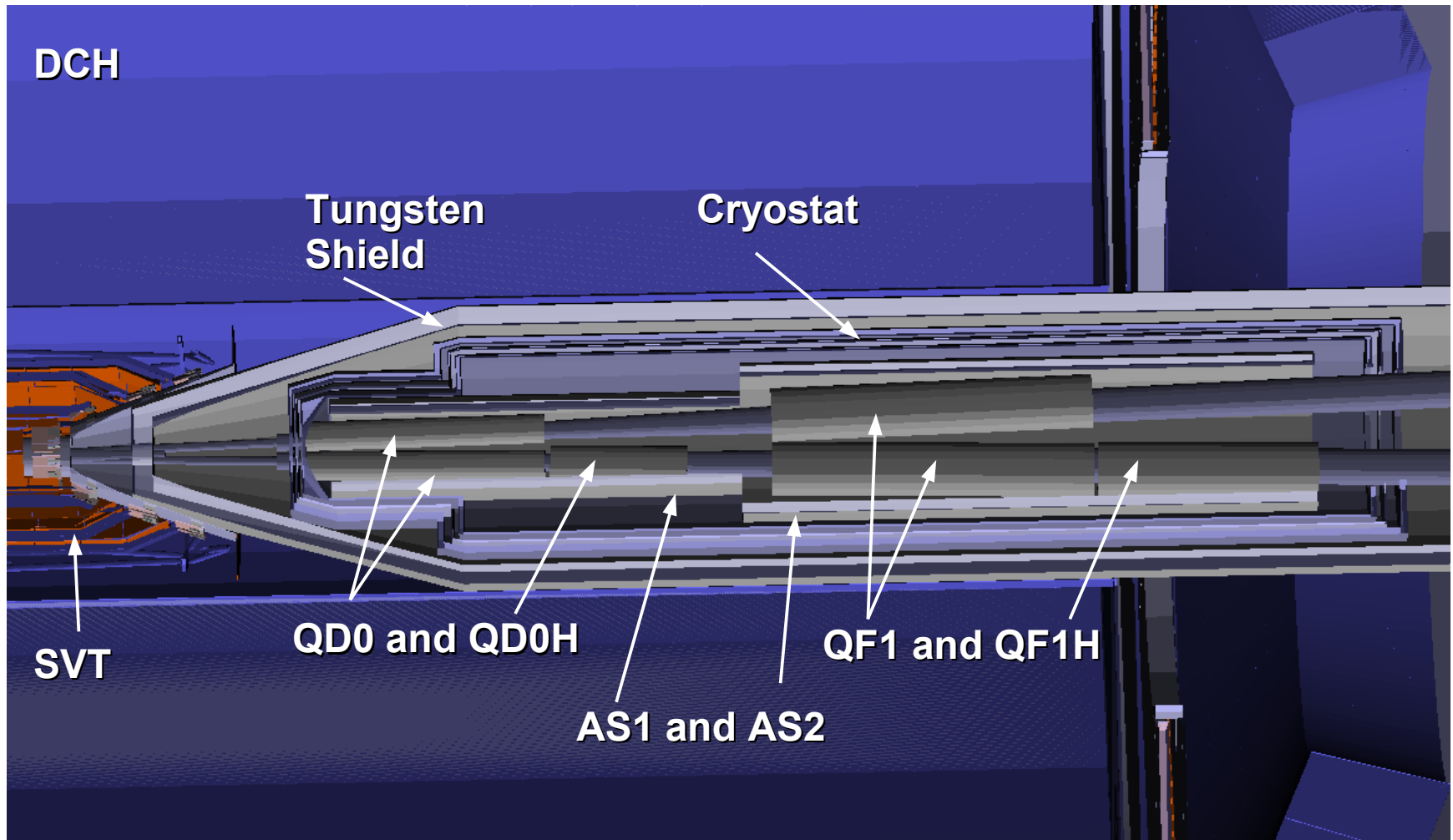
- **Cryostat and magnets implementation in BRN**
- **Magnets instrumentation for absorbed dose studies**
- **Detector solenoidal B-field inside final focus**
- **Summary**

Cryostat and Magnets: Filippo Bosi Drawings

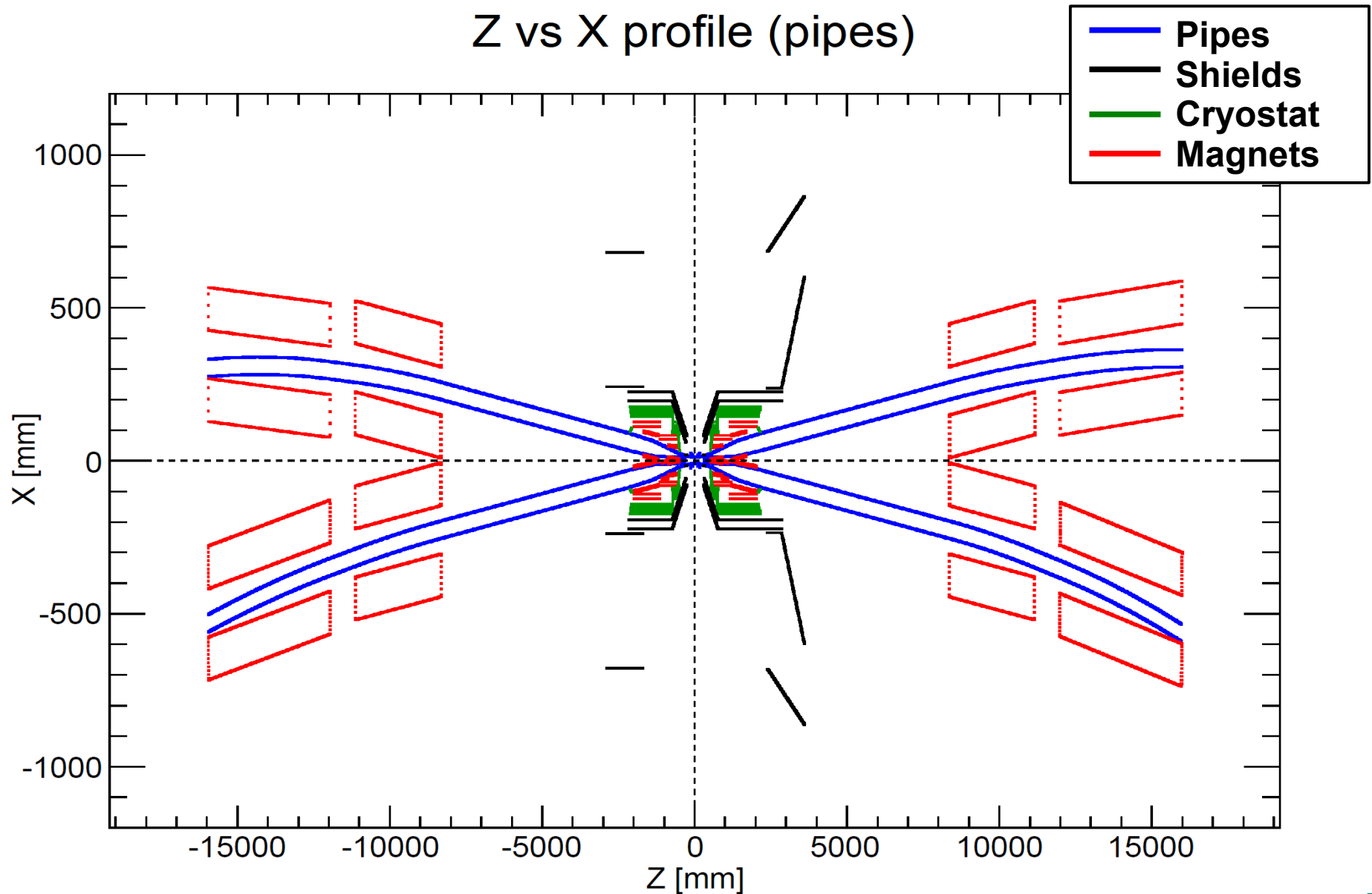


- All magnetic elements are made of the same material (QD0_mixture):
 - Density: 7.57 gr/cm^3
 - Composition: Niobium (0.106), Titanium (0.119), Cooper (0.347) and Iron (0.428)

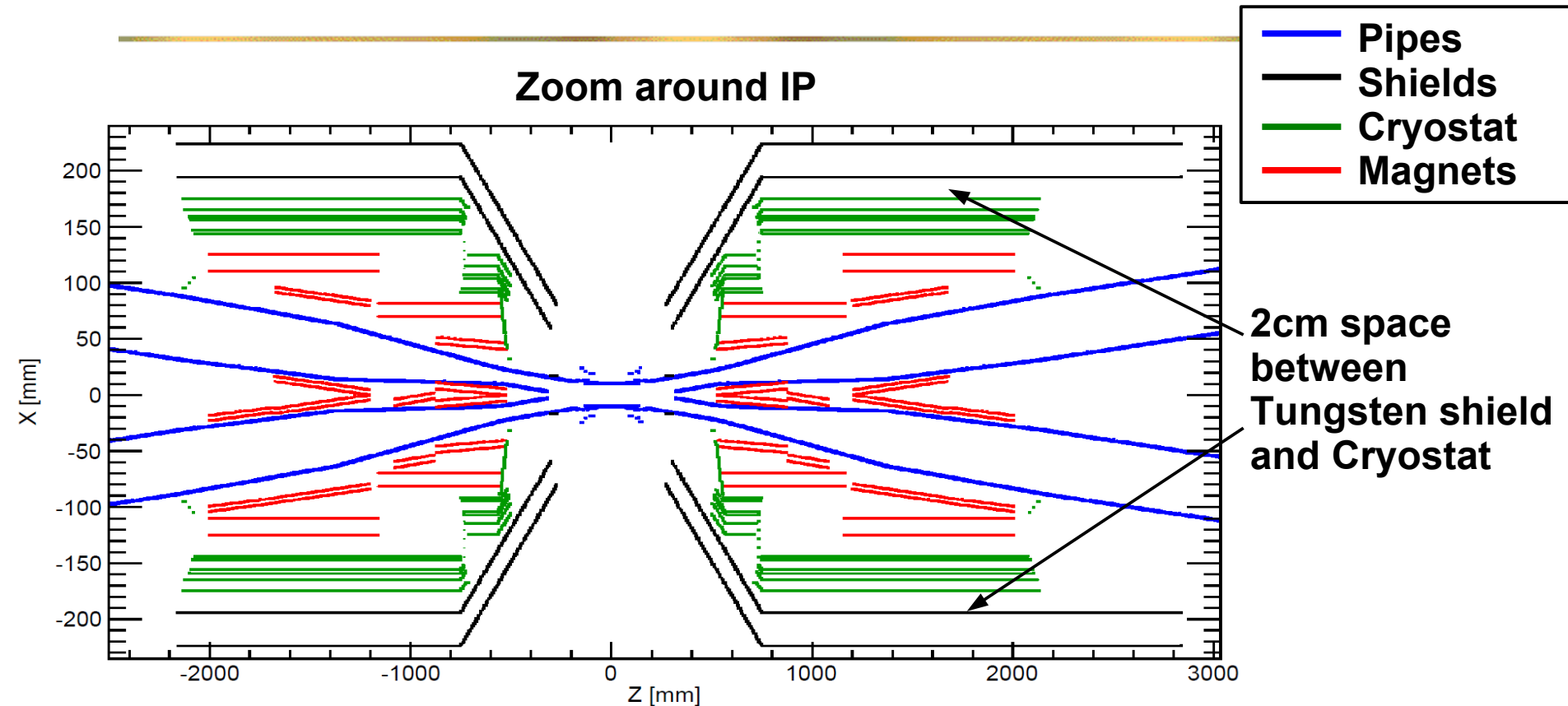
Cryostat and Magnets: BRN implementation (I)



Cryostat and Magnets: BRN implementation (II)



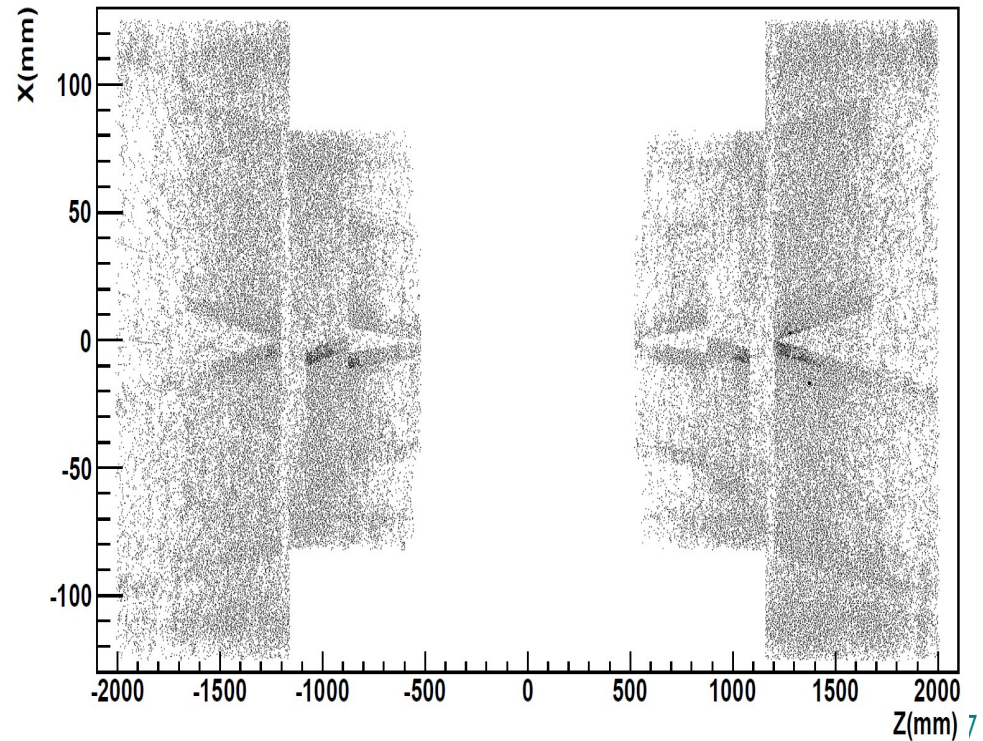
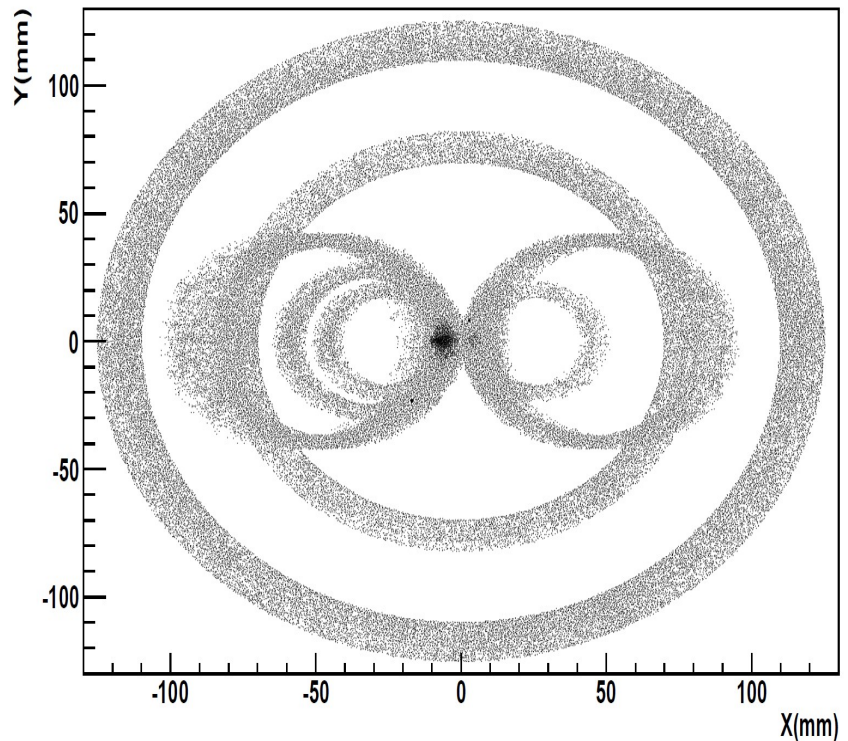
Cryostat and Magnets: BRN implementation (III)



- Space free between cryostat and shield will likely be used for SVT cabling and piping
- Space free between shield and DCH likely used as mechanical clearance
- No much room to increase Tungsten shield. Only possibility is to reduce DCH internal radius

Magnets instrumentation: absorbed dose studies

- Followed instruction from Riccardo
- One branch called QD0Hits on output n-tuple for all the magnets (QD0, QD0H, QF1, QF1H, AS1 and AS2). Can easily distinguish between hits on different magnets by looking at hit location
- Test: 5 Rad-Bhabha bunch crossings. Looked at position of hits.
- Question: any other test I should perform?

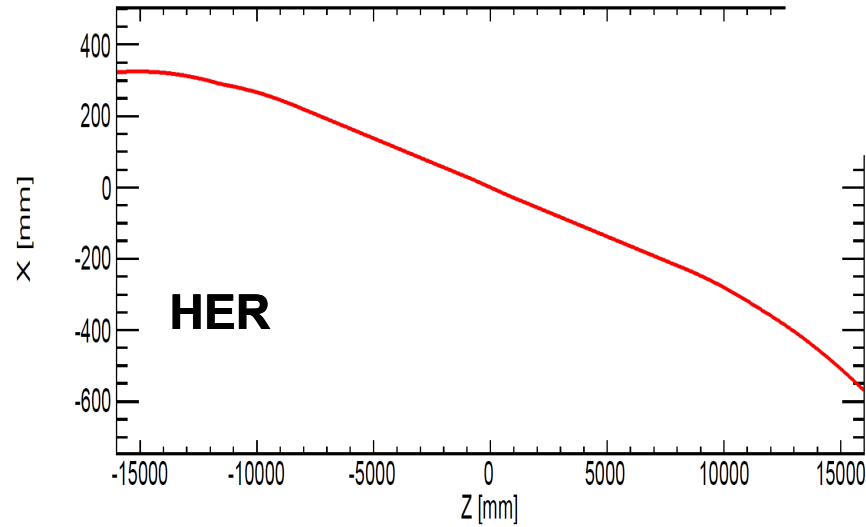


Detector solenoidal B-field: implementation

- Previously: detector solenoidal field turned off in final focus magnetic model
- This field is important for an accurate model of two-photon (pairs) backgrounds on SVT. Less important for Rad-Bhaha and Touschek
- Implementation:
 - Magnitud: 1.5 Tesla
 - Direction: $Z > 0$ (0.0,0.0,1.0)
 - Volume: field different from zero only inside a cylinder of length 40cm and radius 40cm.

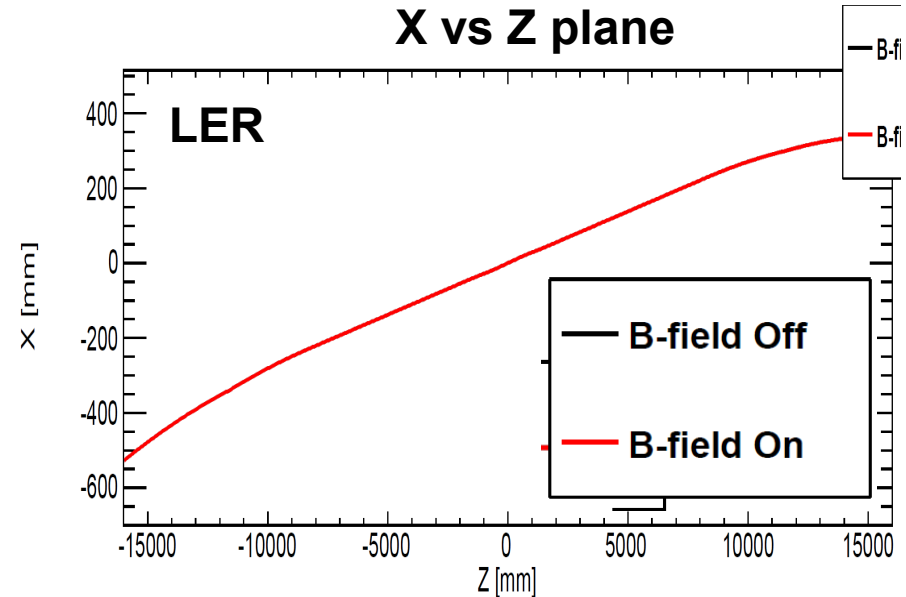
Detector solenoidal B-field: Nominal trajectory (I)

X vs Z plane

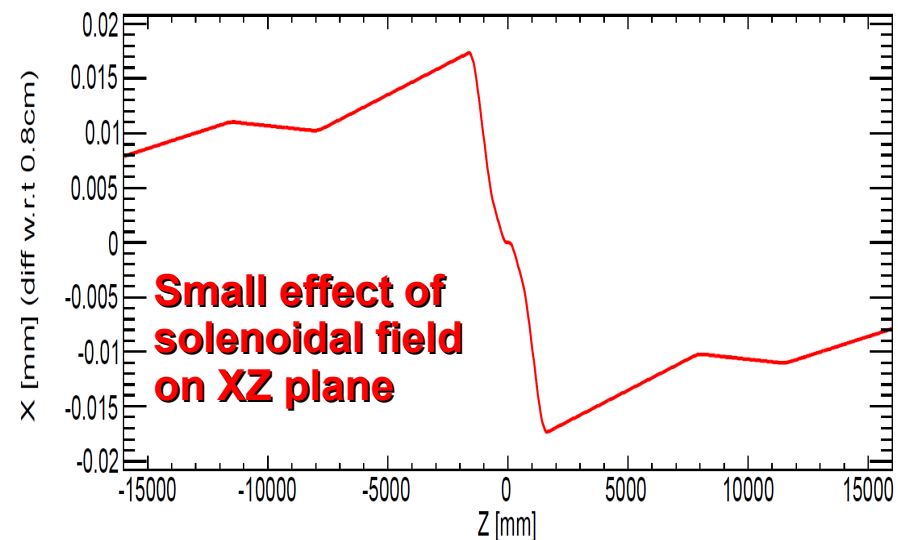
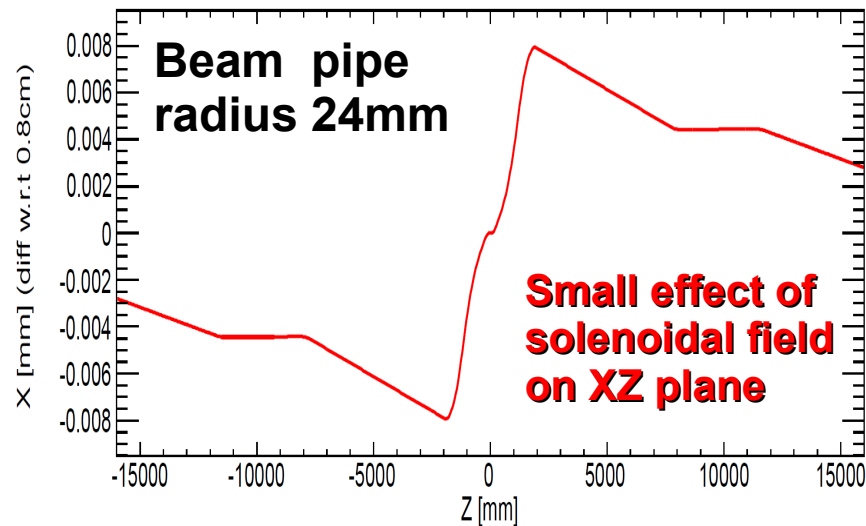


X vs Z (diff w.r.t 0.8cm)

X vs Z plane

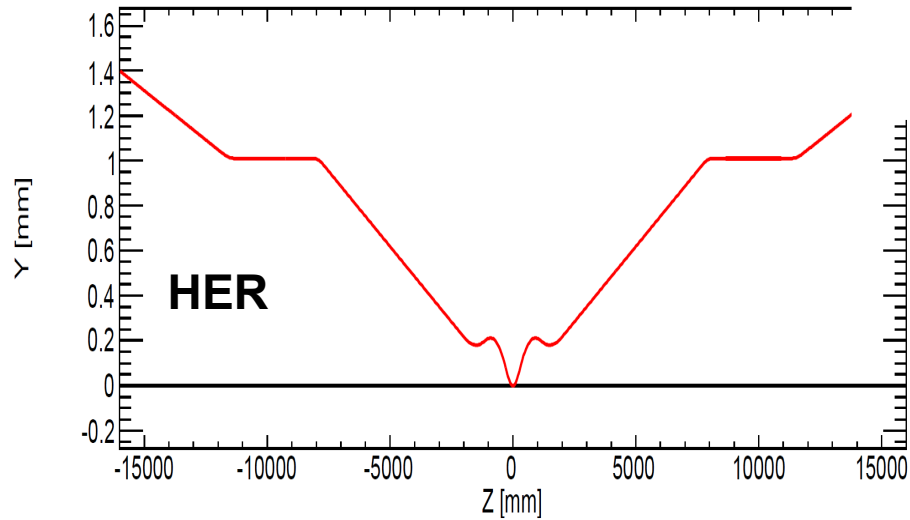


X vs Z (diff w.r.t 0.8cm)

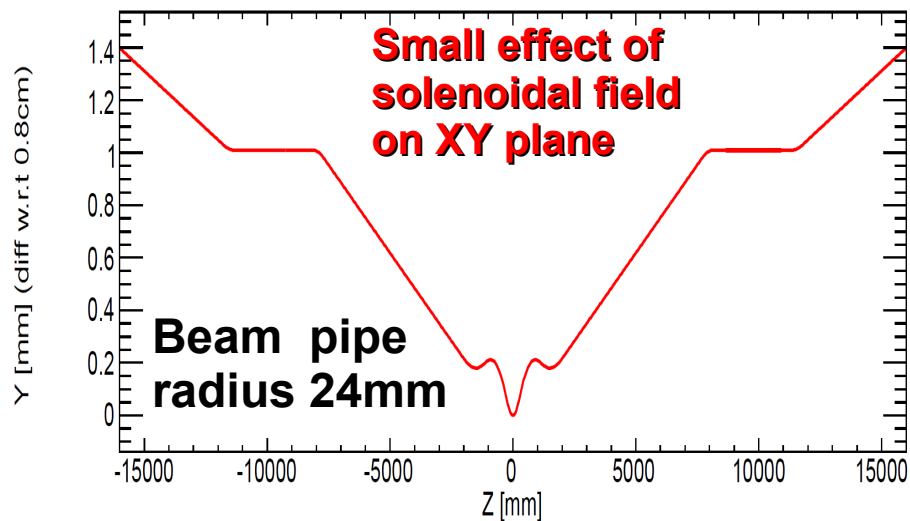


Detector solenoidal B-field: Nominal trajectory (II)

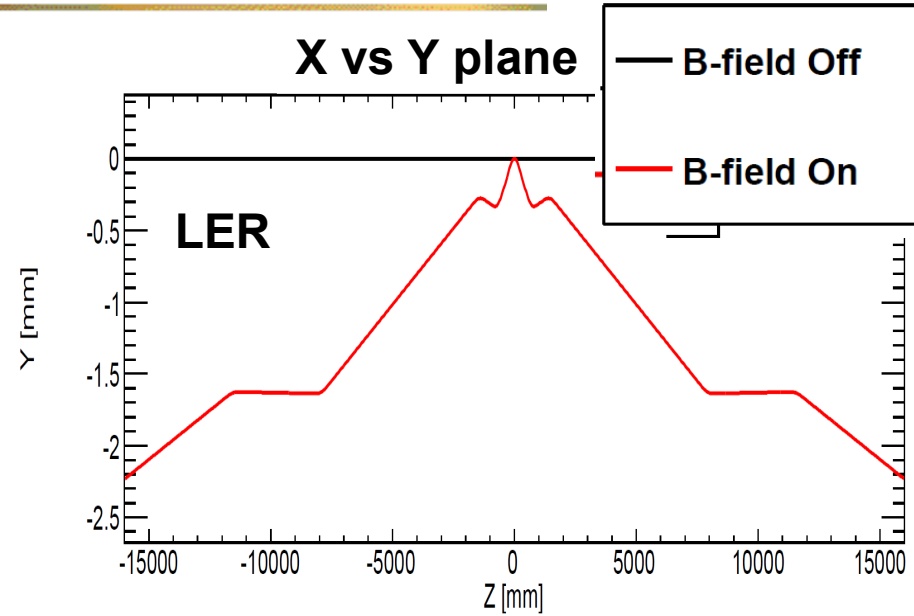
X vs Y plane



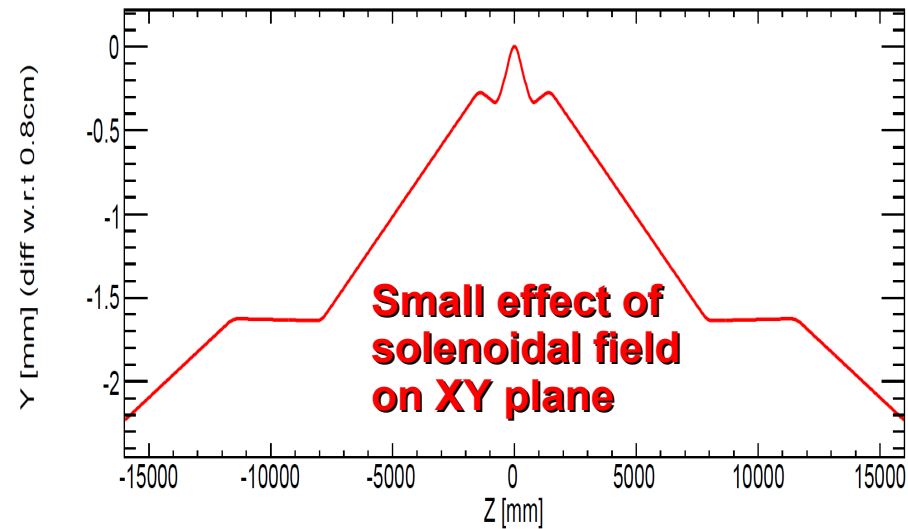
Y vs Z (diff w.r.t 0.8cm)



X vs Y plane



Y vs Z (diff w.r.t 0.8cm)



Summary

- **Implemented cryostat and magnets material in BRN. Clearer view on available free space inside final focus**
⇒ Can only increase tungsten shield by reducing DCH internal radius
- **Instrumented magnets for absorbed dose studies**
- **Implemented detector solenoidal B-field in final focus magnetic model**
⇒ Small effect on nominal trajectory

Backup