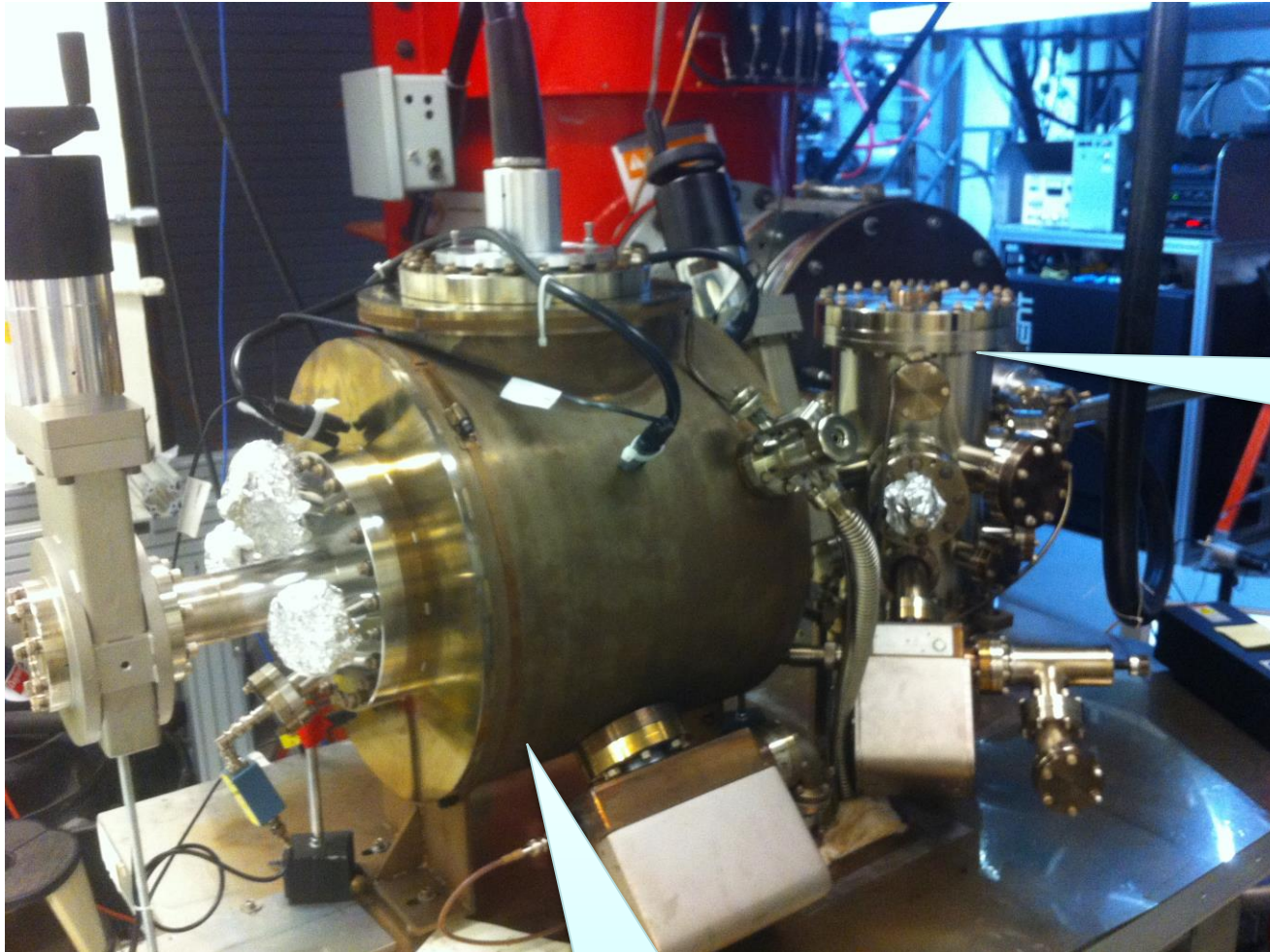


# **Gun Magnet Design**

December 27, 2015

# Magnetized Gun

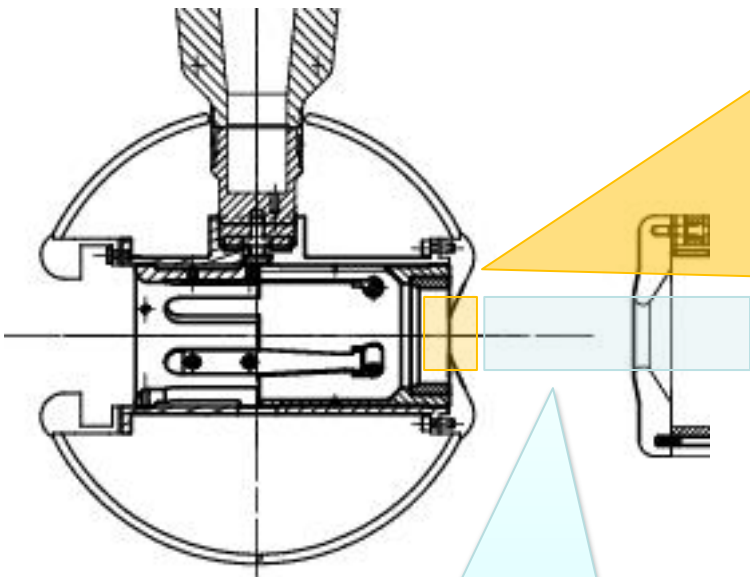


K<sub>2</sub>CsSb  
Preparation  
Chamber

HV Chamber

# Magnetic Field at Cathode

Beam radius	0.3 cm
Field at cathode ( $B_z$ )	2 kG

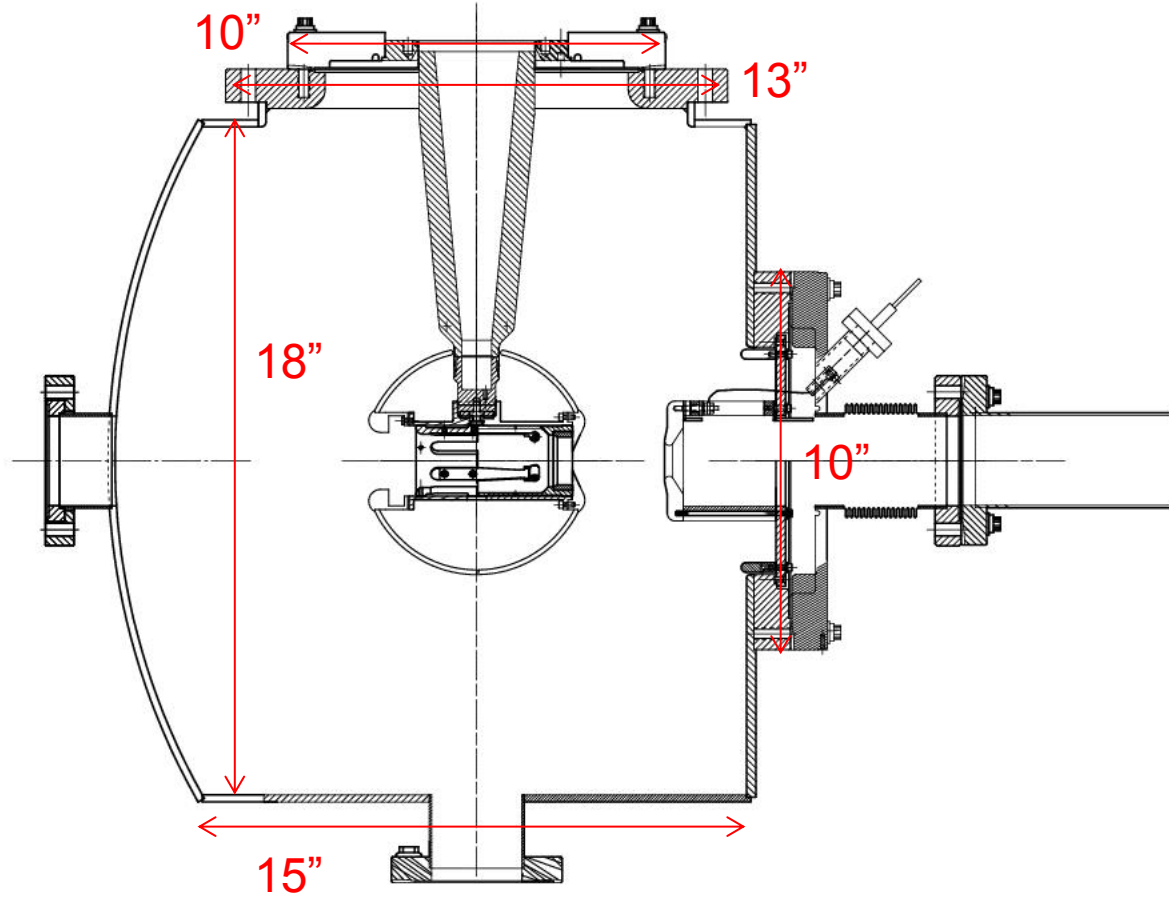


$B_z, B_r$ : relevant to beam transport

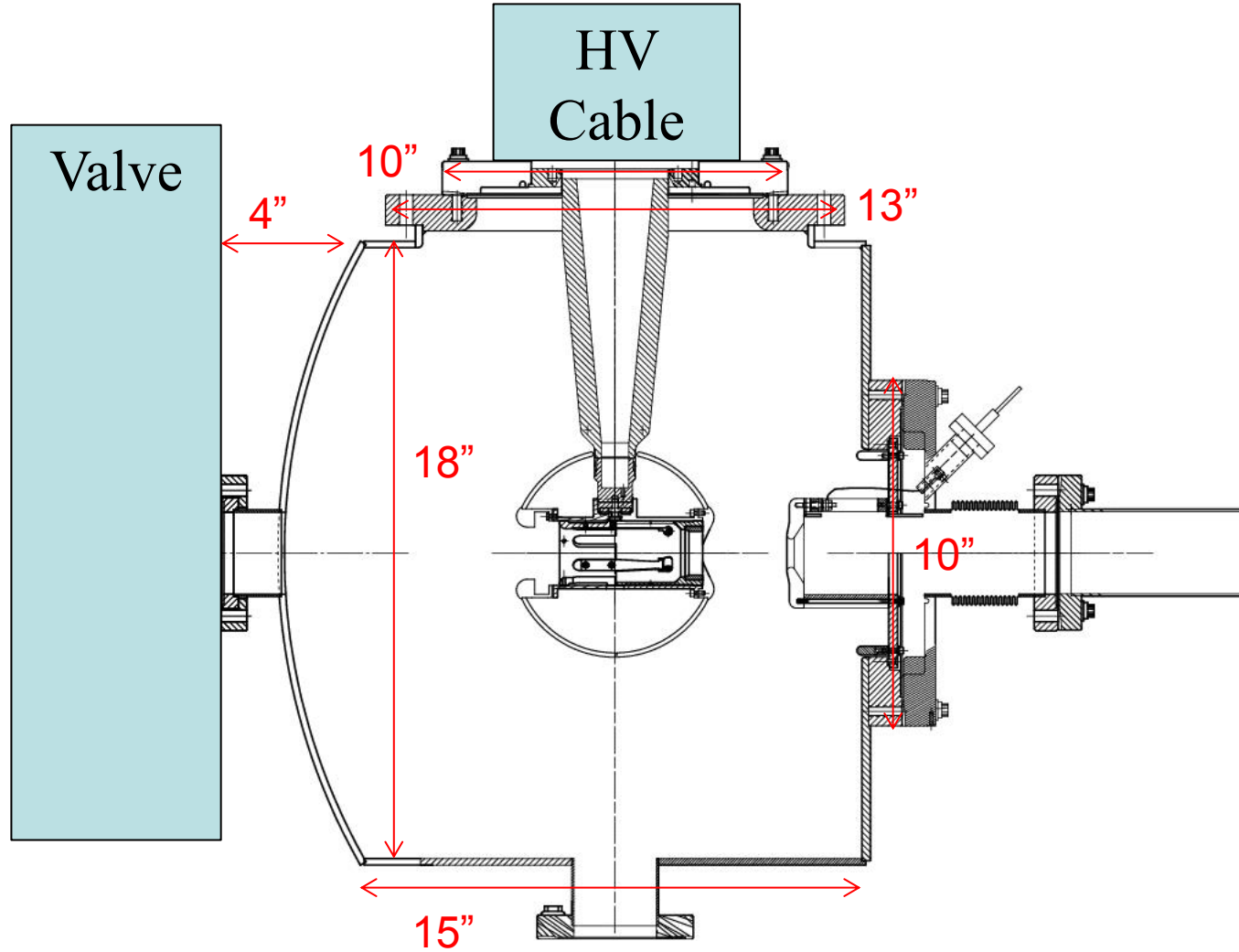
## Magnetization field (???):

- Along z:
  1.  $B_z = 2$  kG
  2. Varying slowly to be able know value from S&A
- Along r:
  1. Radius = 0.5 cm
  2. Uniformity:  $\frac{\delta B_z}{B_z} < 1\%$  (?)

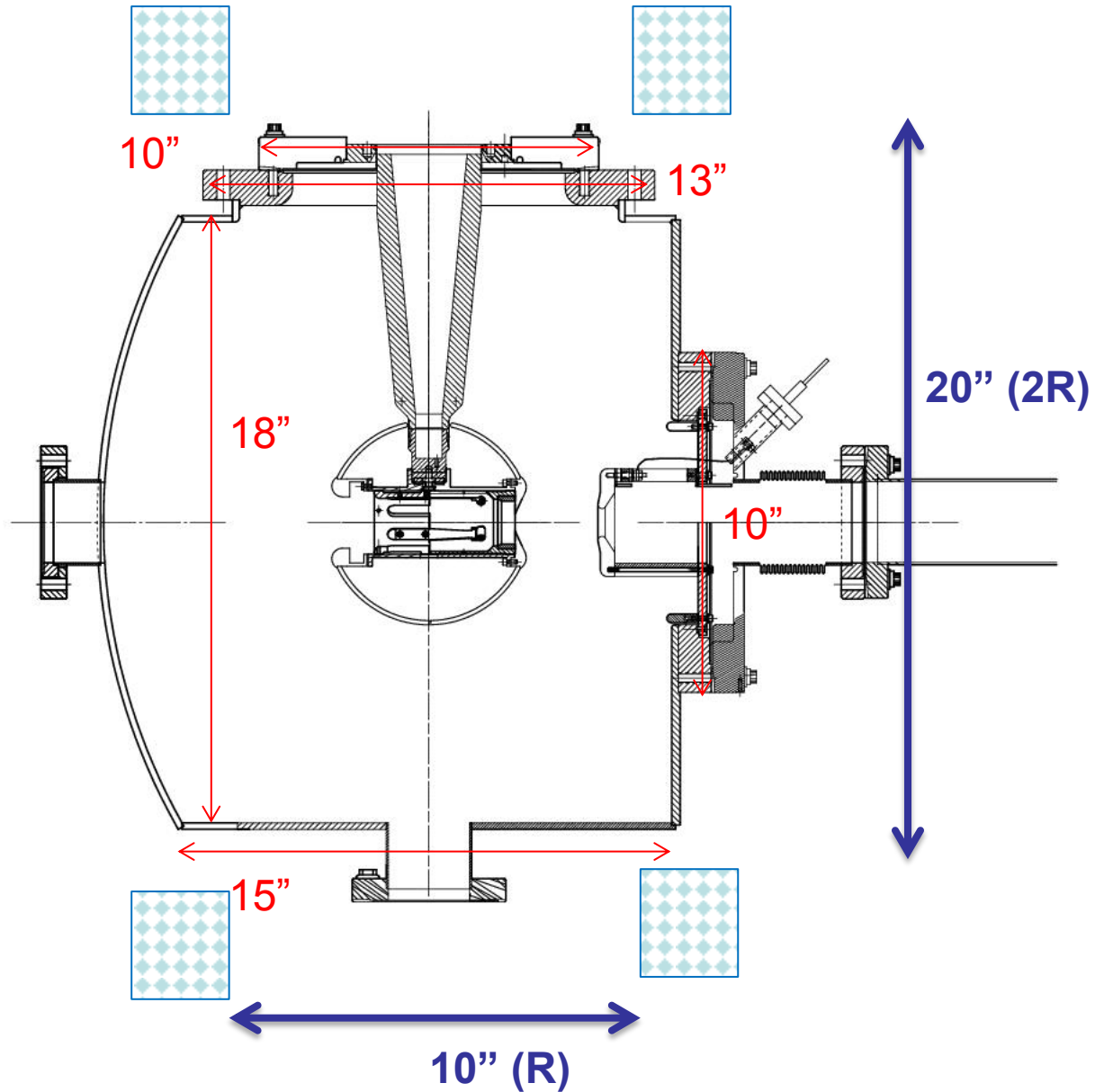
# HV Chamber



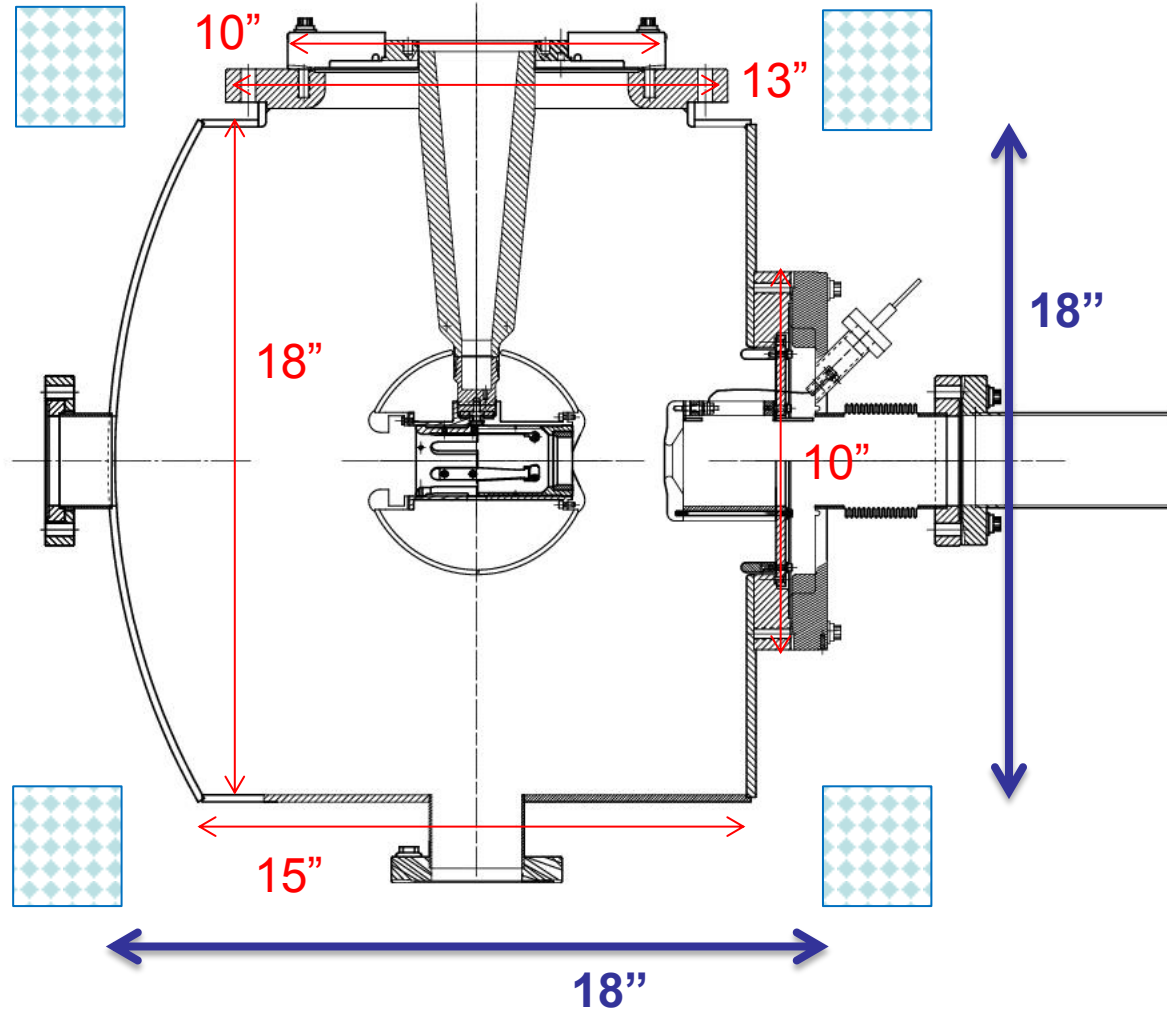
# HV Chamber Clearance



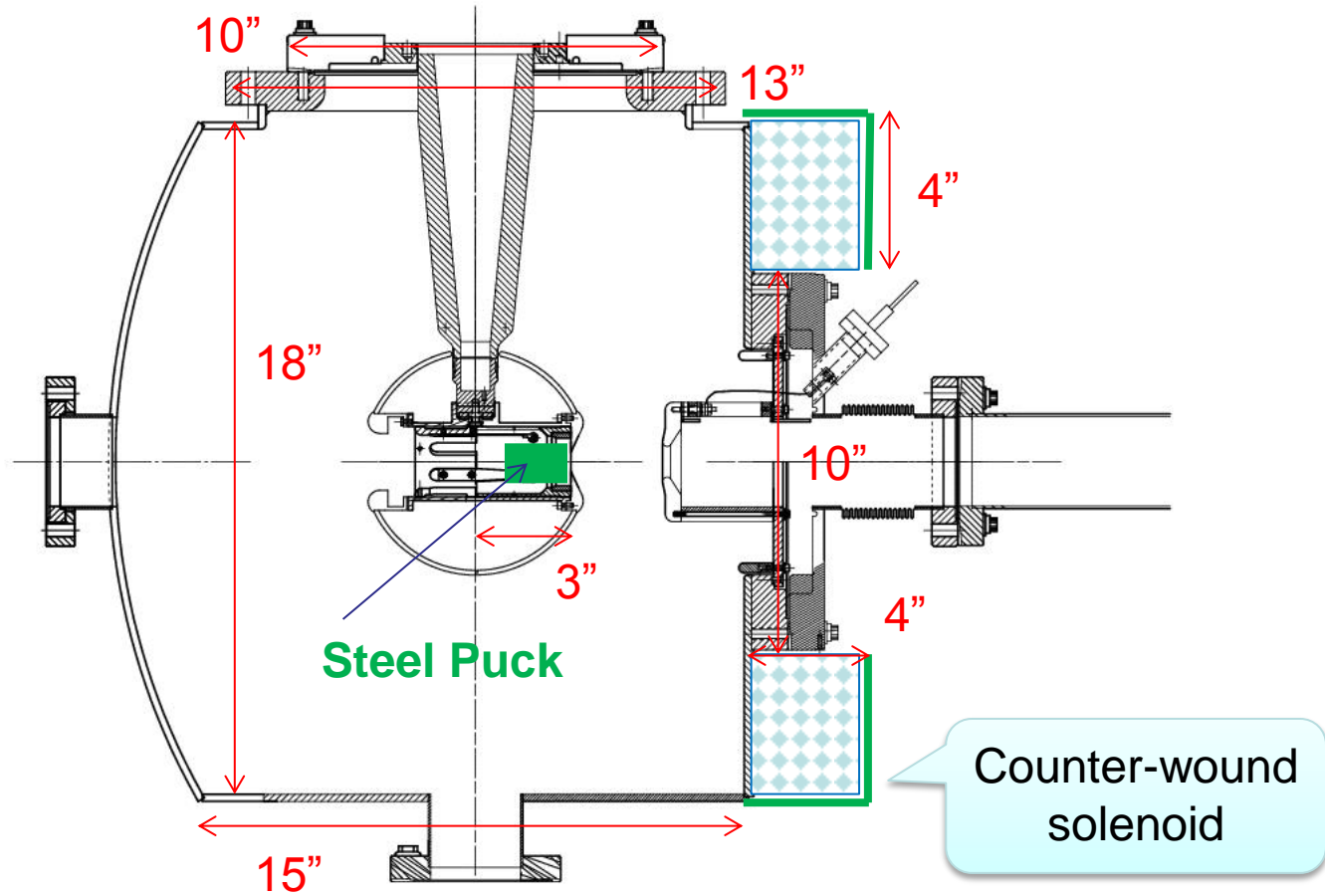
# Design 1: Helmholtz Pair



# Design 2: Two coil Magnet

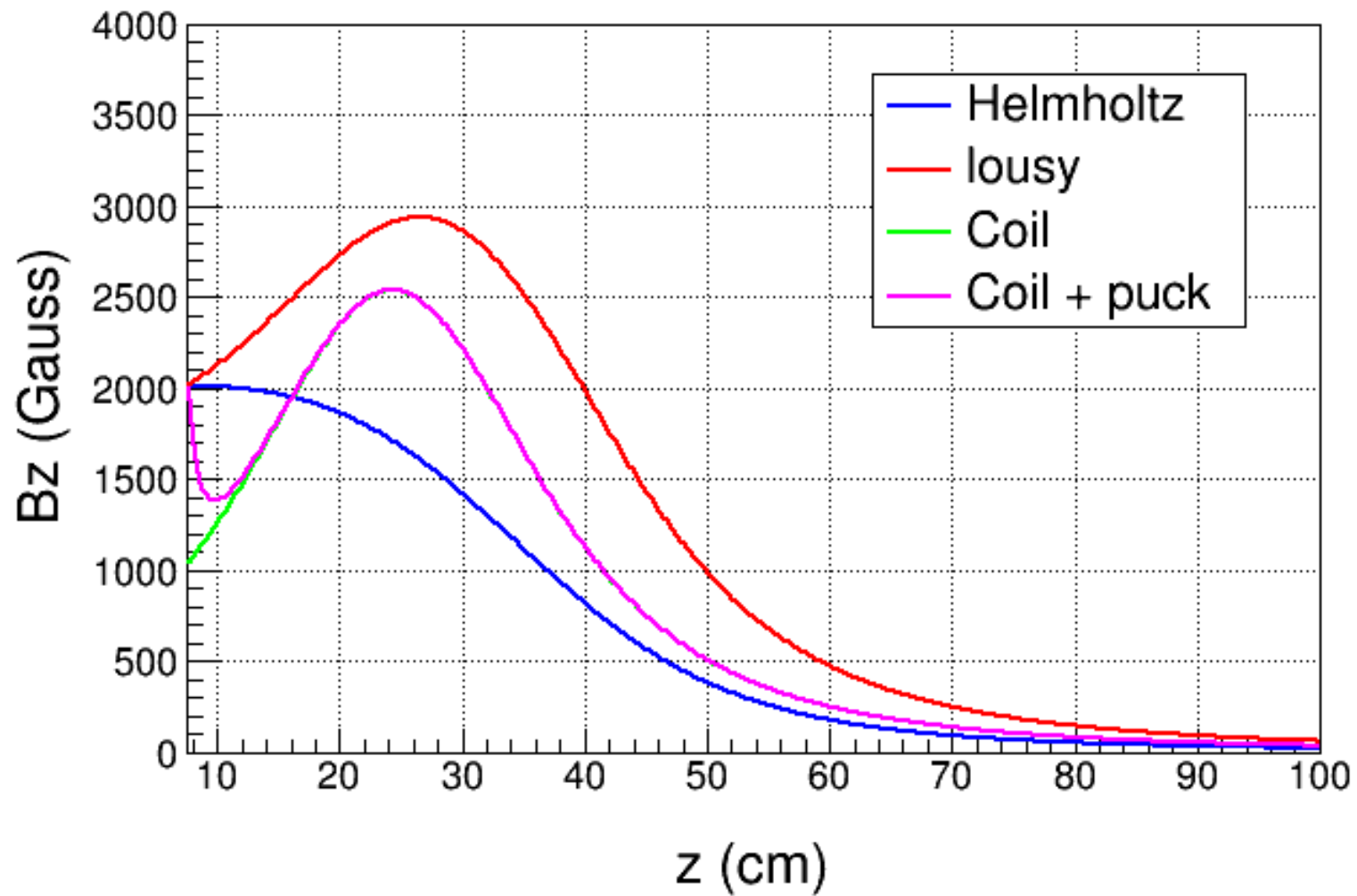


# Design 3: One Solenoid + Steel Puck

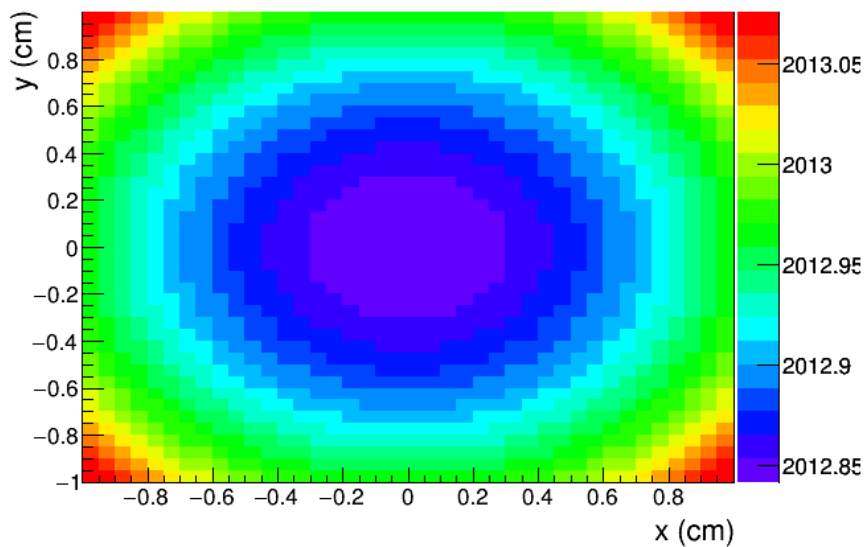




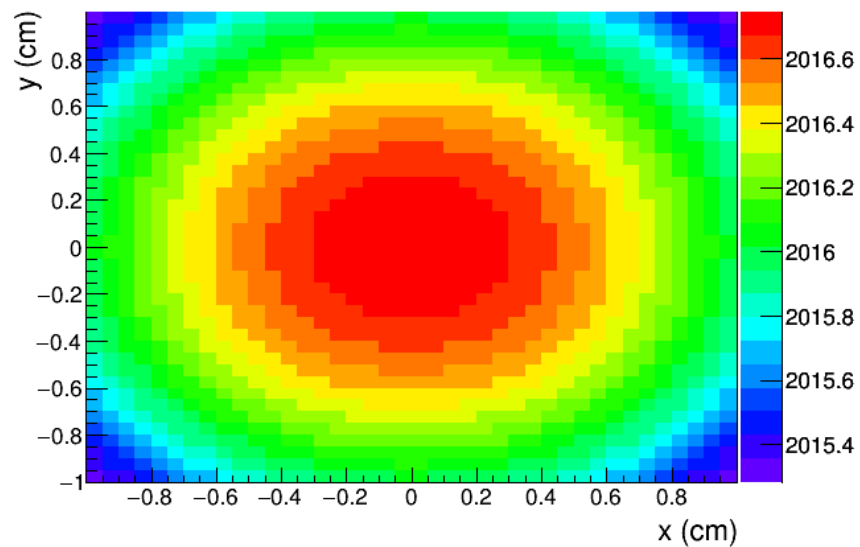
# $B_z$ vs $z$



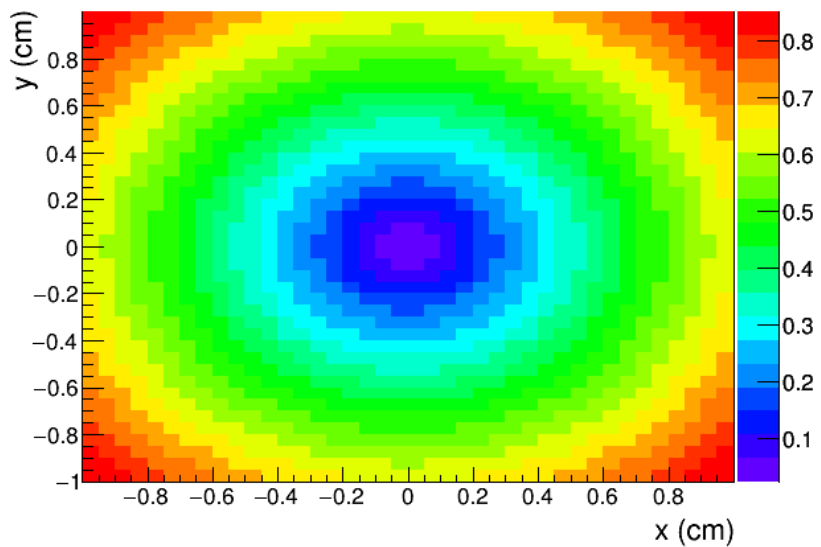
Helmholtz: Bz (Gauss)



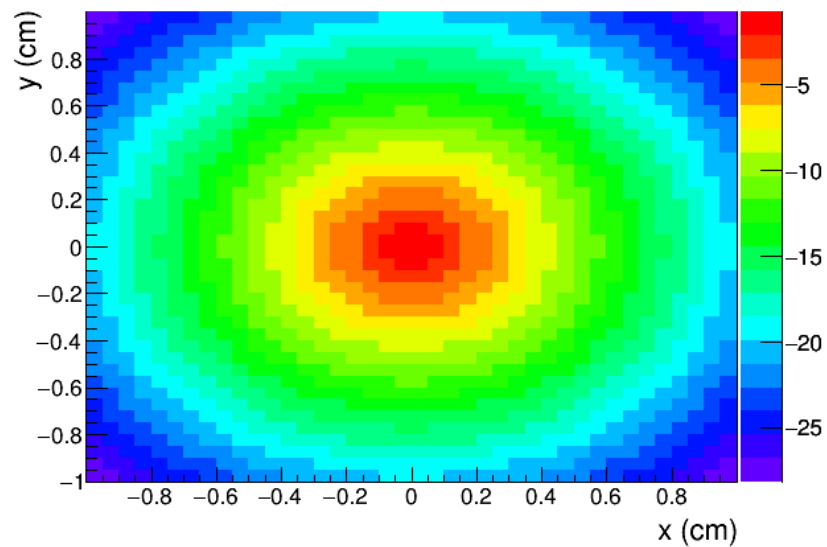
Lousy: Bz (Gauss)



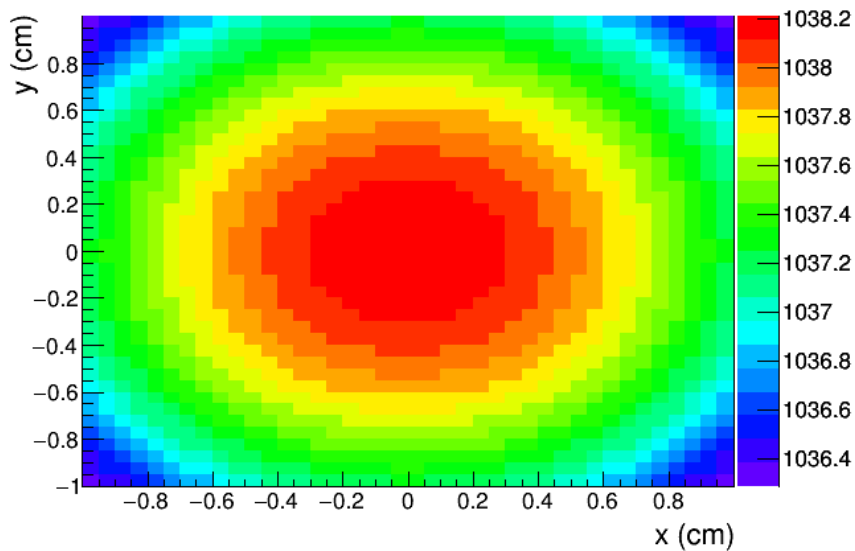
Helmholtz: Br (Gauss)



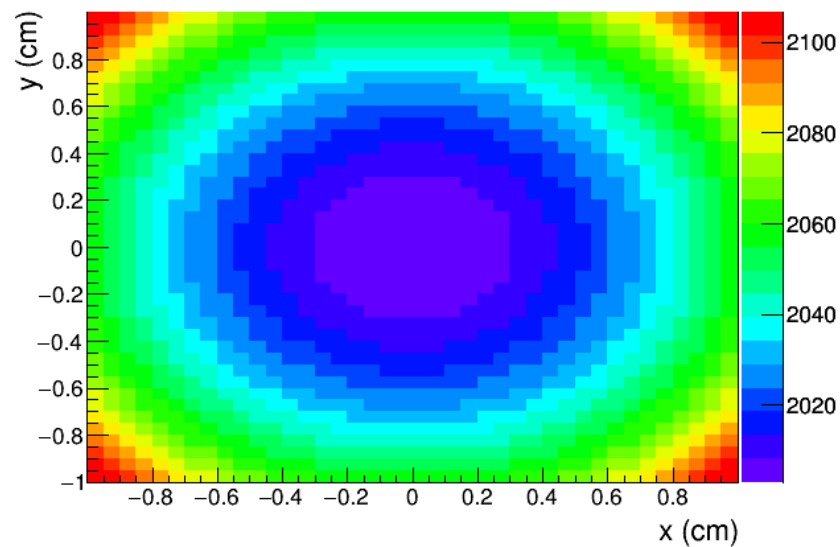
Lousy: Br (Gauss)



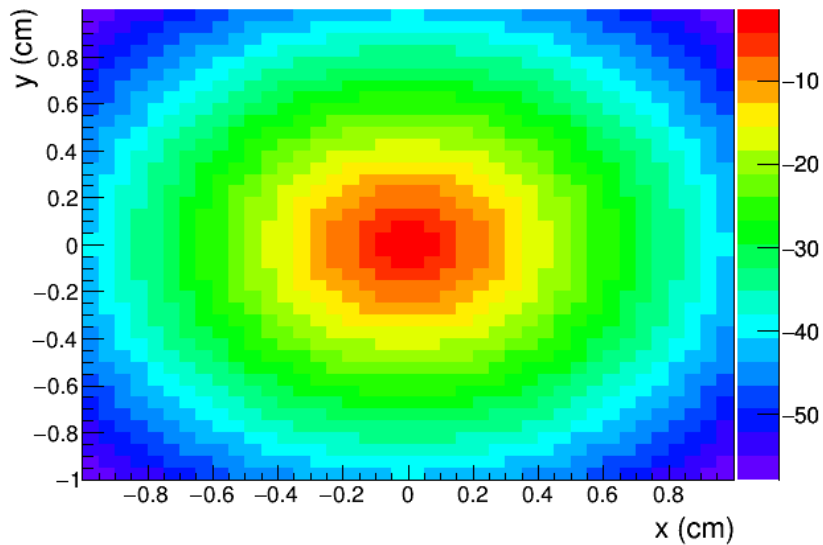
One Coil Air: Bz (Gauss)



One Coil Puck: Bz (Gauss)



One Coil Air: Br (Gauss)



One Coil Puck: Br (Gauss)

