

# Leakage field of GLD

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KEK

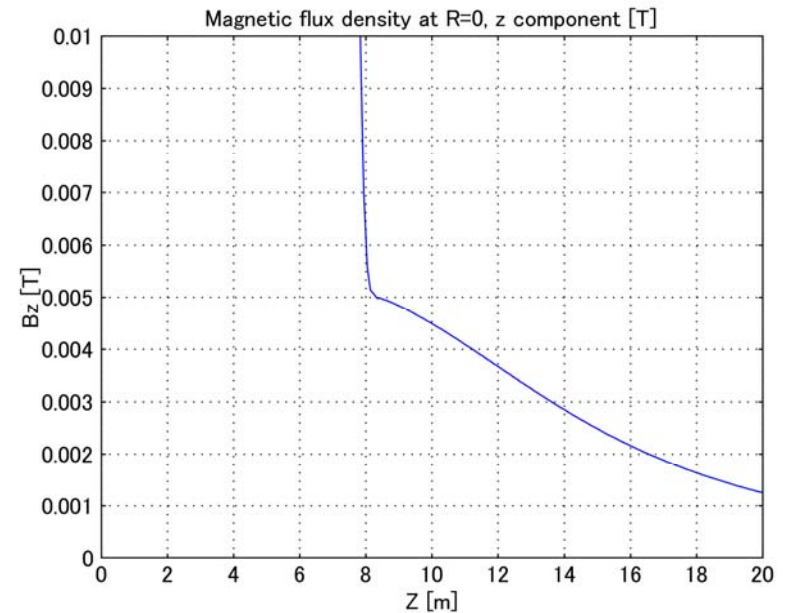
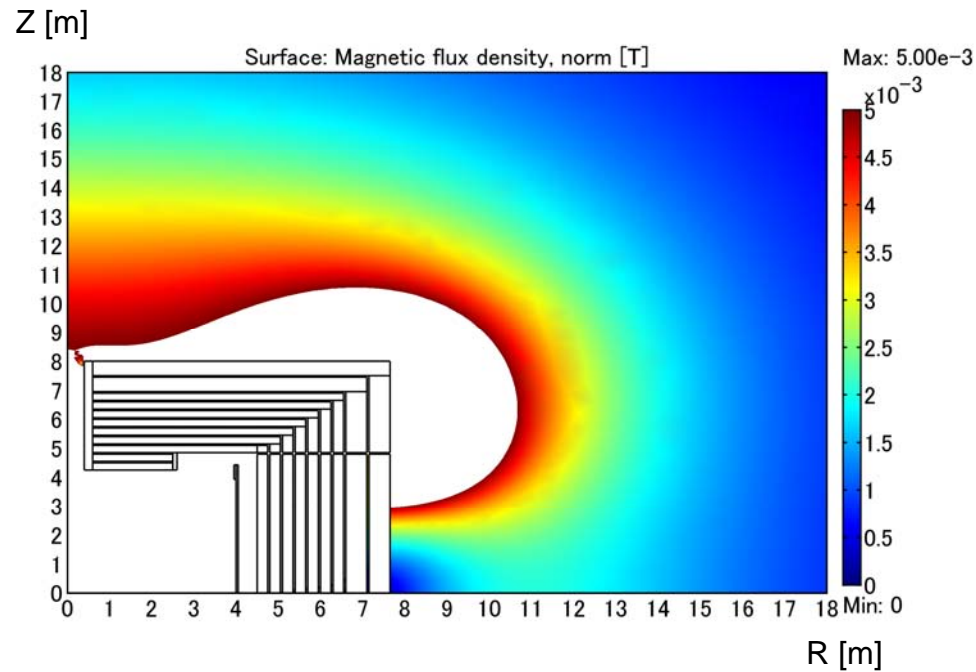
@MDI Panel Meeting

20 Sep. 2006

# Estimated Configurations

- GLD baseline design
  - BY; R=7.65m, EY; Z=8m
- New GLD design
  - Less iron yoke: BY; R=7.2m, EY; Z=7.5m ( $\Delta m=3750t$ )
  - With/without compensation coil at z=10m and 12.5m
  - With iron shield around beam line
- GLD a la CMS
  - Barrel; 5 rings, EC; 2 parts
  - 5cm gaps between the segments

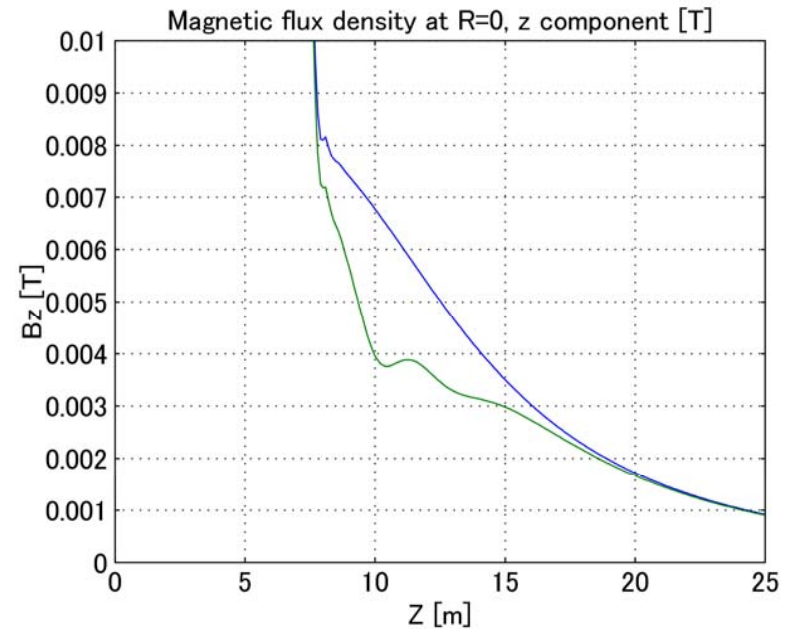
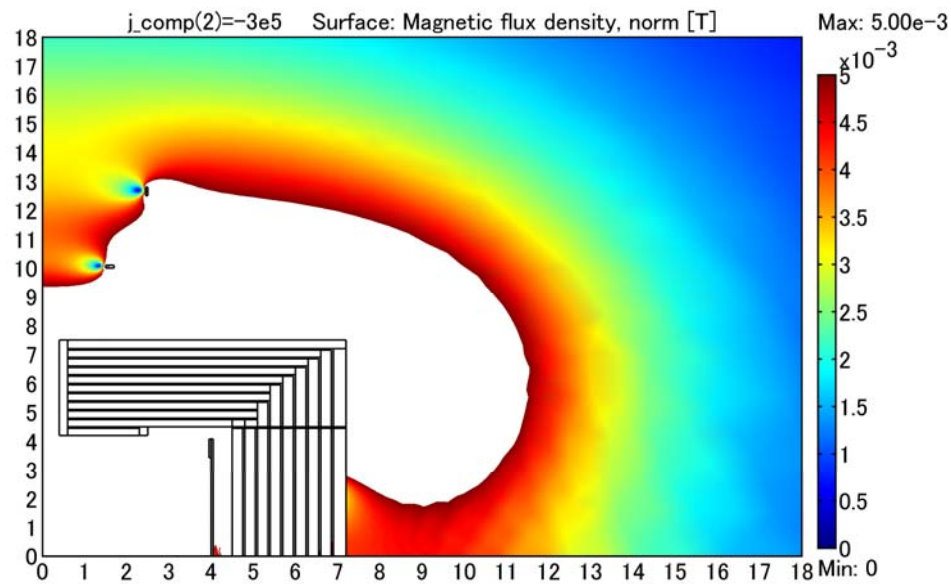
# GLD baseline design



- FEA calculation using COMSOL
- Axial symmetric 2D analysis

# New GLD design

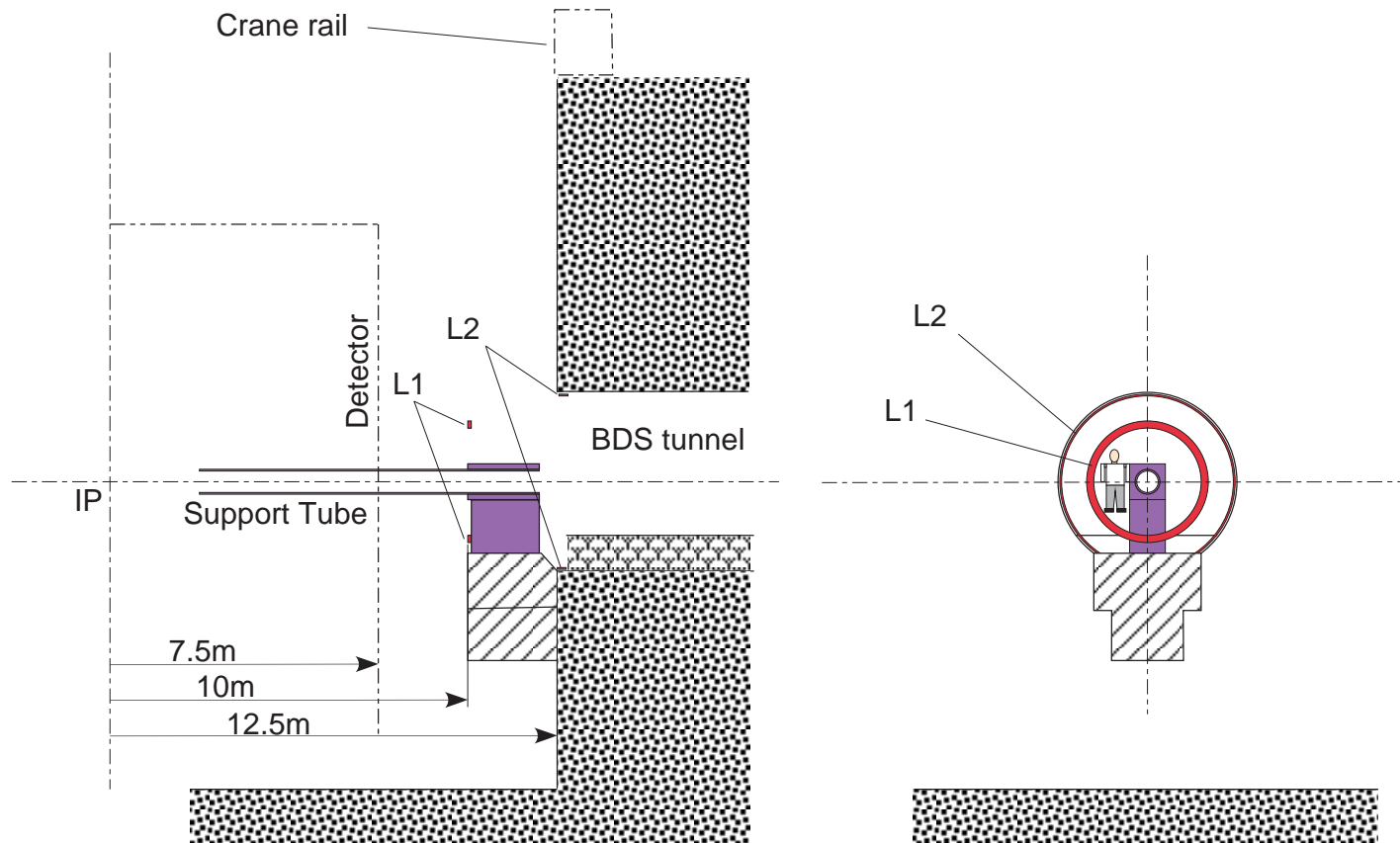
- With / without compensation coil



L1:  $Z=10\text{m}$ ,  $R=1.5\text{m}$ , 6kAT  
L2:  $Z=12.5\text{m}$ ,  $R=2.45\text{m}$ , 4.5kAT

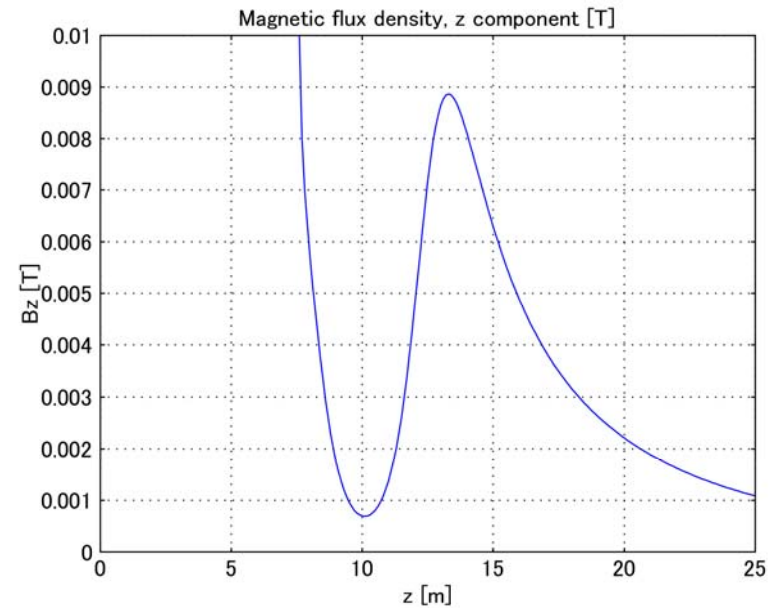
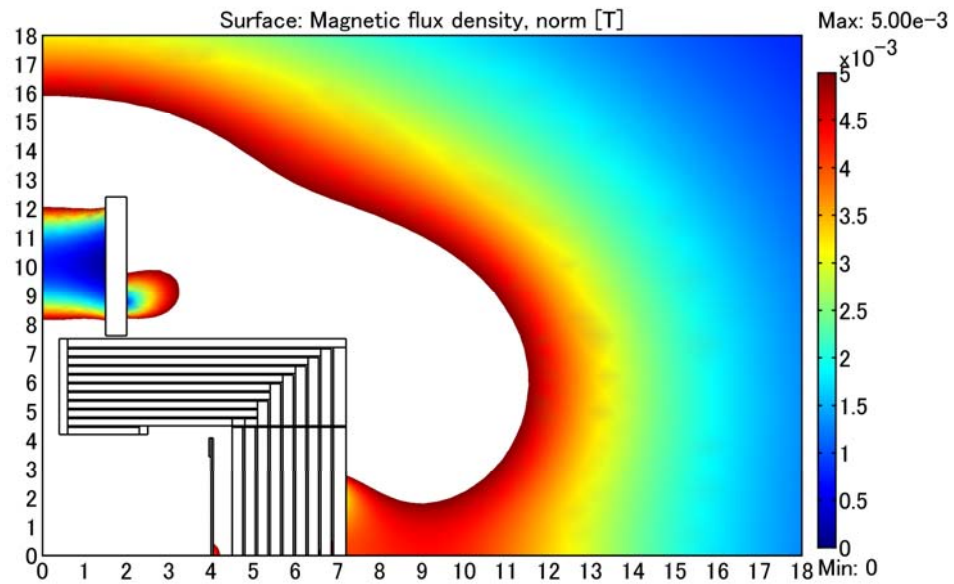
# New GLD design

- Configuration of compensation coils

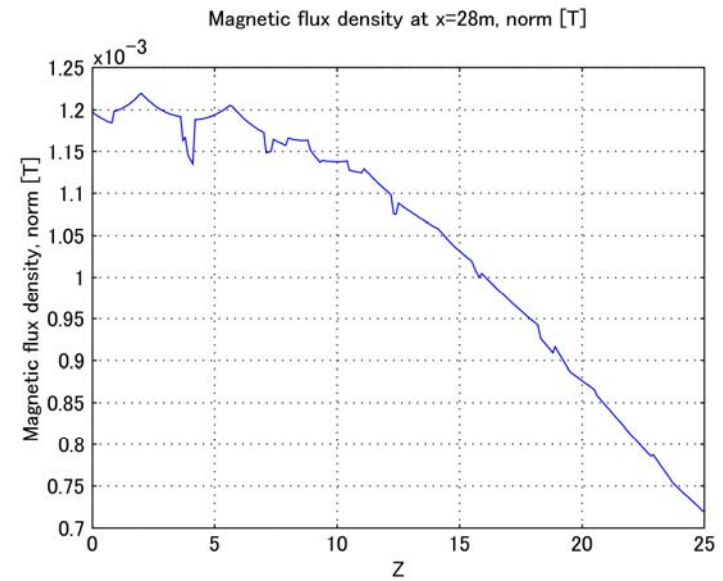
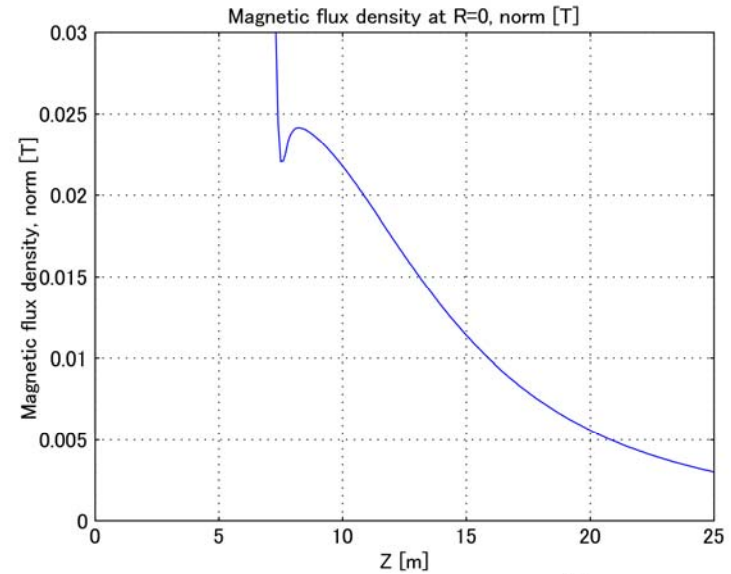
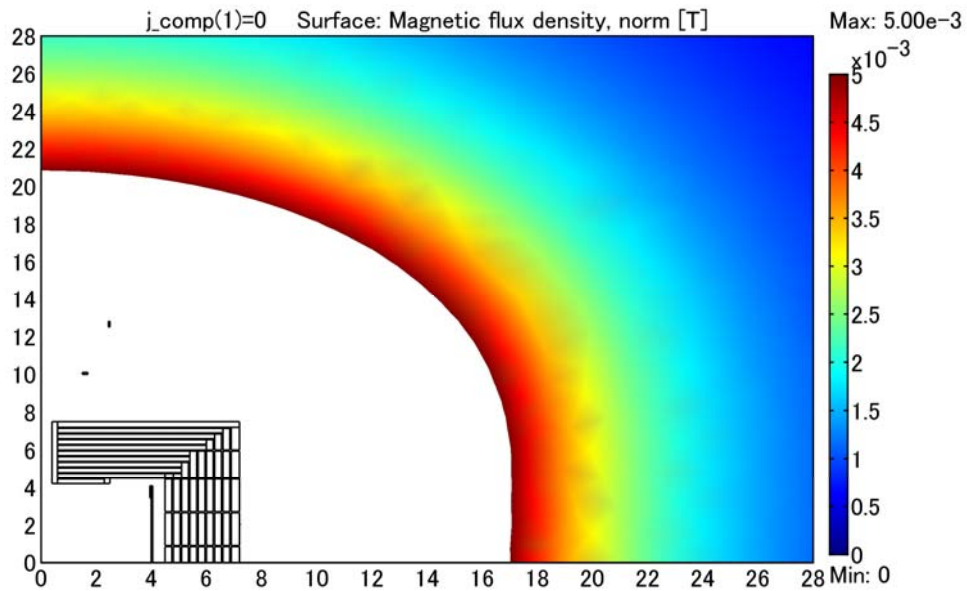


# New GLD design

- With iron shield (Inner part of radiation shielding)  
 $7.6\text{m} < Z < 12.5\text{m}$ ,  $1.5\text{m} < R < 2\text{m}$



# GLD a la CMS



# Conclusion

- New GLD return yoke design will work in terms of leakage field ( $B < 50\text{G}$  for  $Z > 10\text{m}$ ) if compensation coils are installed
- Probably no water cooling is necessary for the compensation coils and the cost for them would be very small
- We can save 3750 ton of iron with the new GLD design compared with the baseline design in DOD