

# Compact GLD

August 2/July 30, 2007

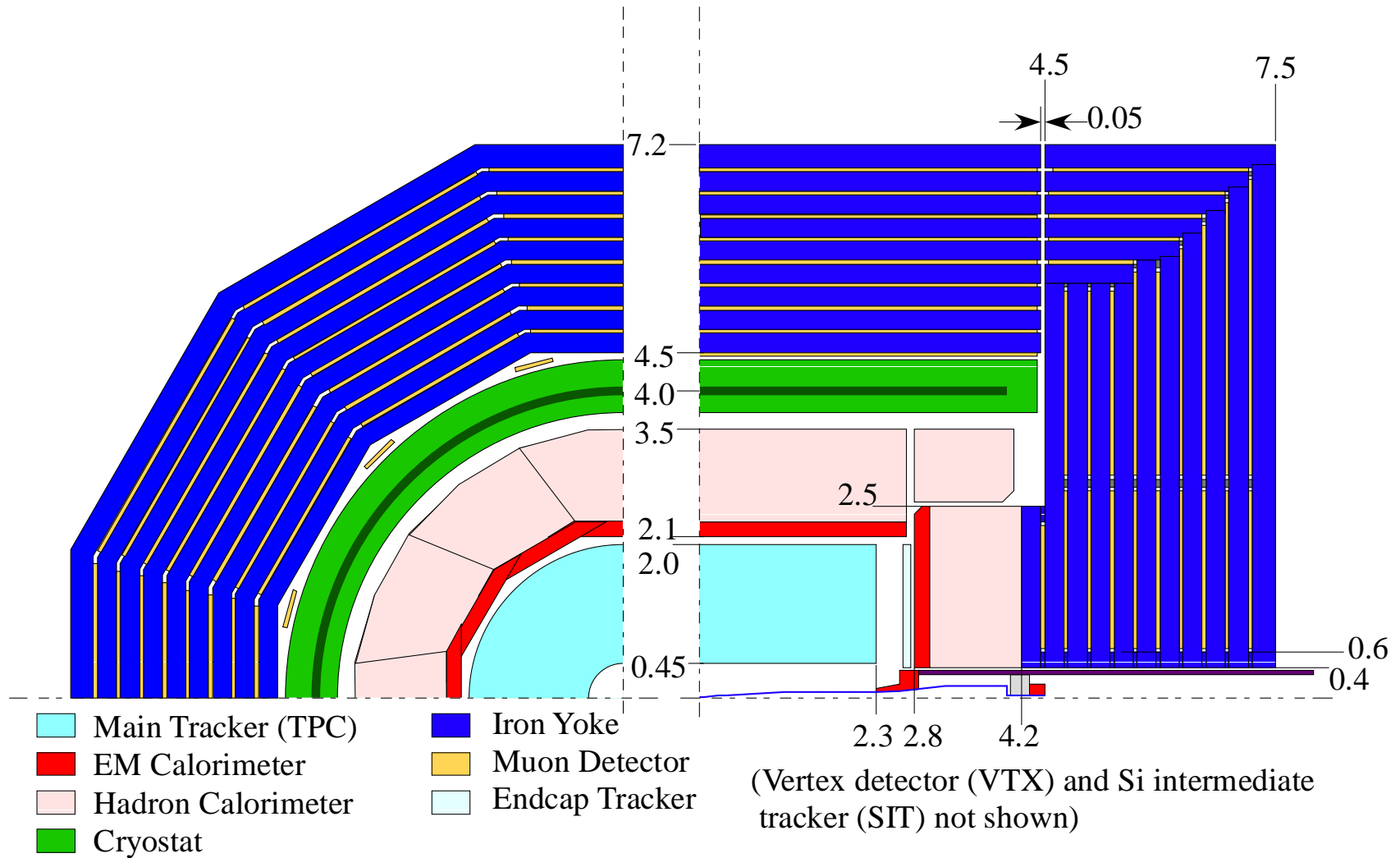
Y. Sugimoto

KEK

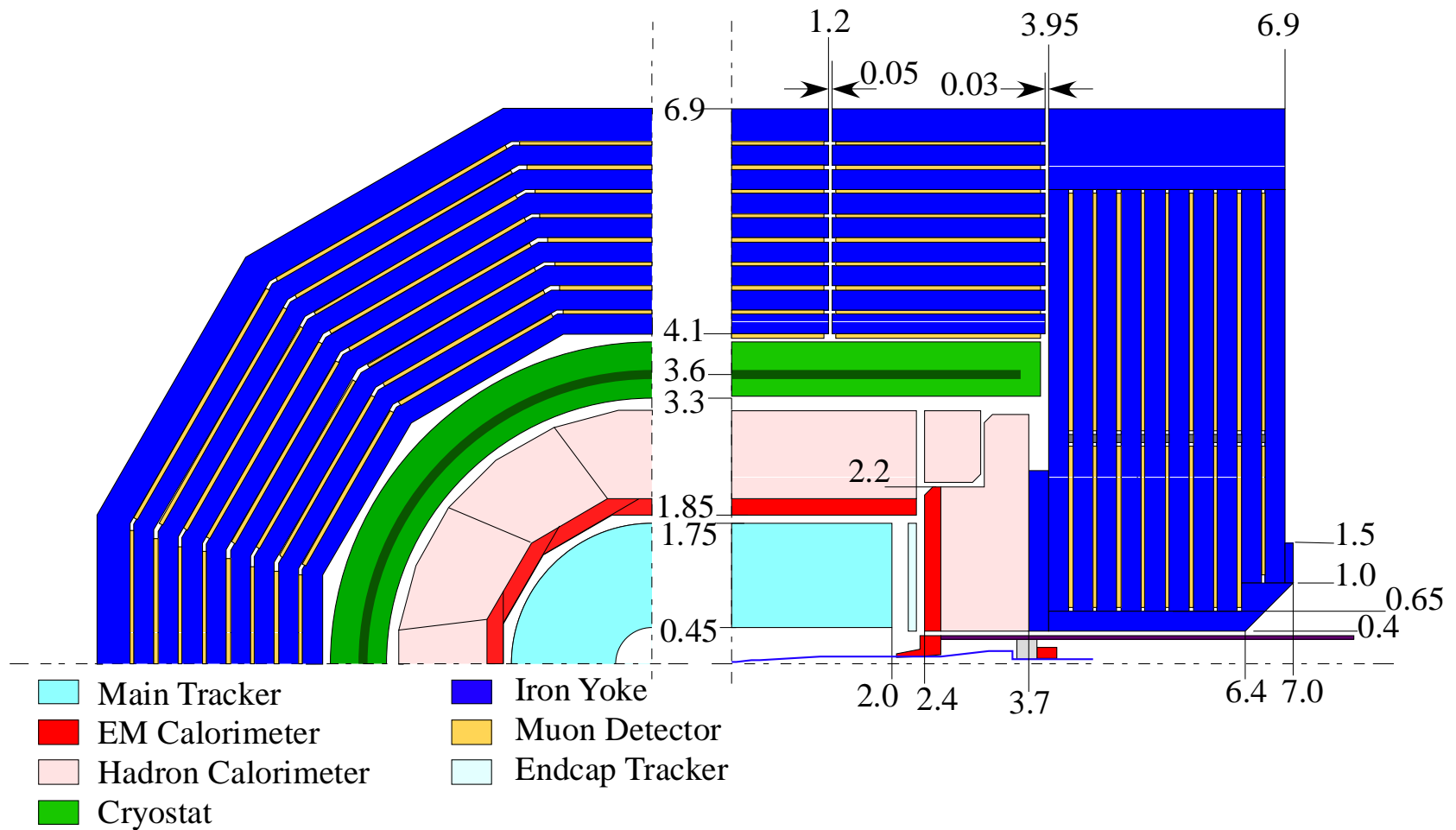
# Motivation

- GLD and LDC will write a common Lol
- The detector design should have common parameters
- Modified design of GLD with the central values for B and  $R_{CAL}$  between original GLD and LDC is made
- $B=(3+4)/2=3.5$  T
- $R_{CAL}=(2.1+1.6)/2=1.85$  m

# Original GLD



# Compact GLD - GLDc



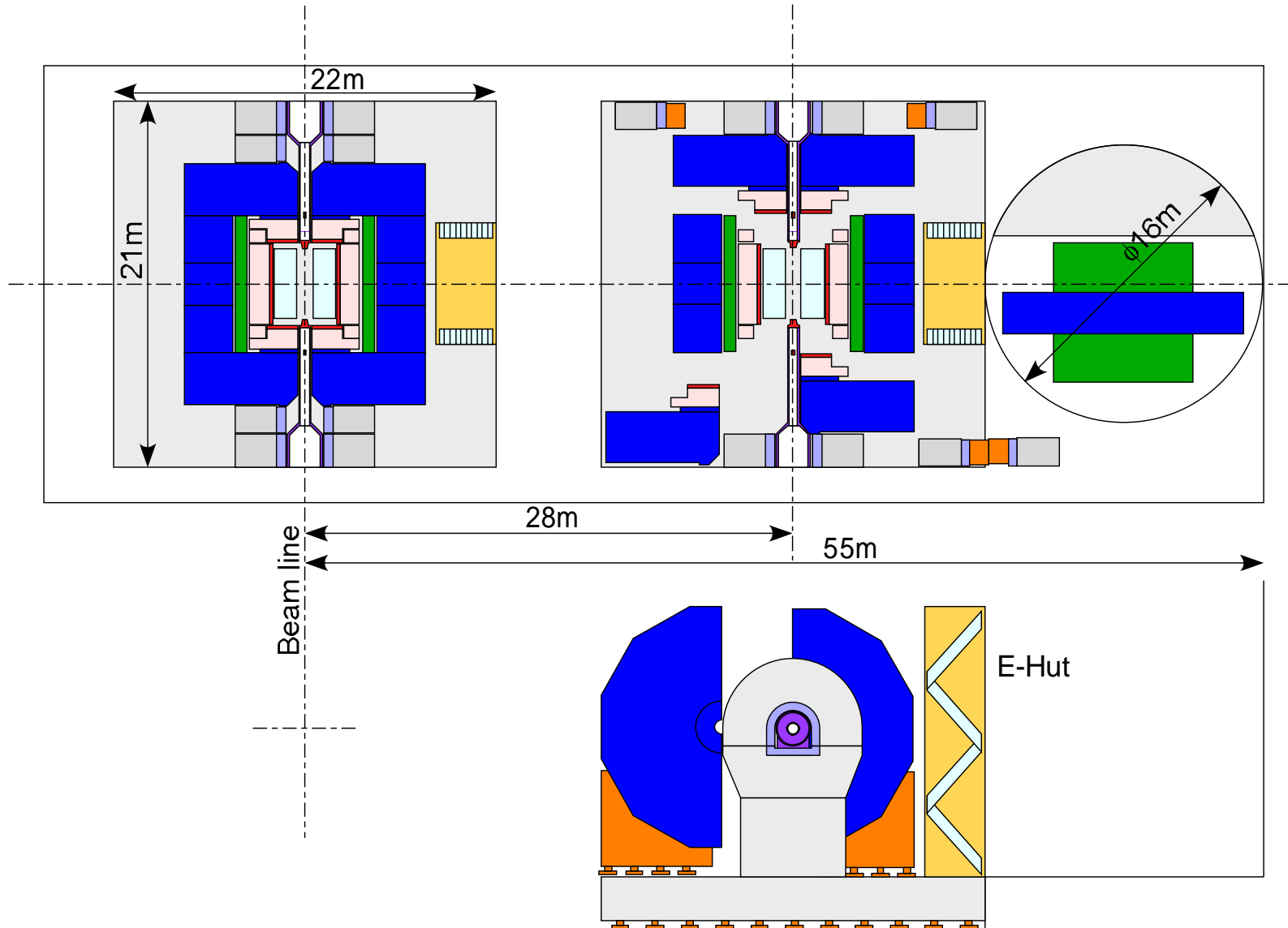
# Parameters (1)

			GLD	GLDc
Iron Yoke	Barrel	Rout	7.2 m	6.9 m
		Rin	4.5 m	4.1 m
		Weight	6090 t	5080 t
	E.C.	Zin	4.2/4.5 m	3.7/3.95 m
		Zout	7.5 m	6.9 m
		Weight	3260 t / side	3050 t / side
Solenoid	B		3 T	3.5 T
	R		4 m	3.6 m
	Z		4 m	3.6 m
	E		1.6 GJ	1.7 GJ
Stray field @Z=10m			70 G	120 G

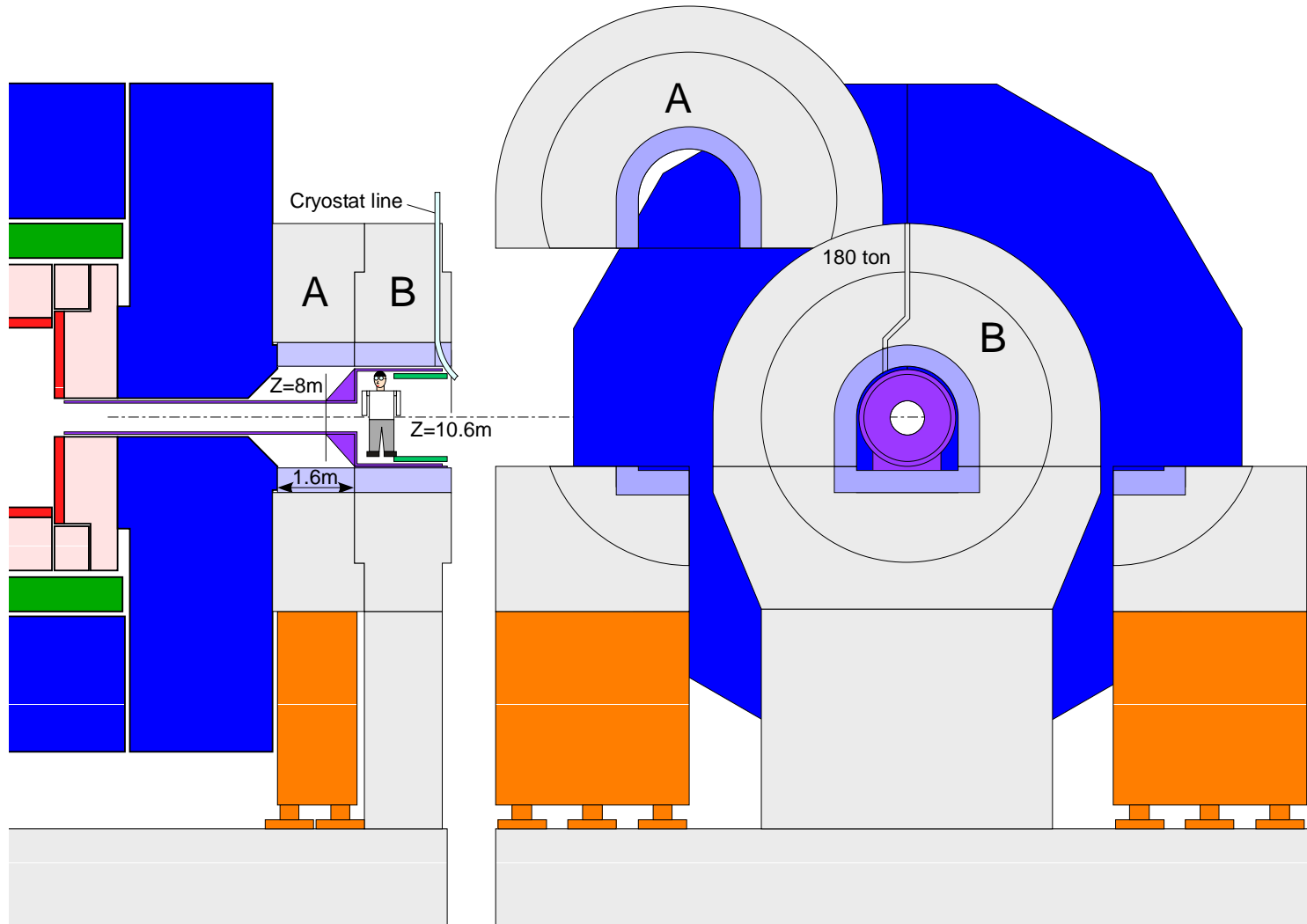
# Parameters (2)

			GLD	GLDc
TPC	Rin		0.45 m	0.45 m
	Rout		2.0 m	1.75 m
	Zmax		2.3 m	2.0 m
Barrel CAL	ECAL	Rin	2.1 m	1.85 m
		Rout	2.3 m	2.05 m
		BRin <sup>2</sup>	13.2 Tm <sup>2</sup>	12.0 Tm <sup>2</sup>
	HCAL	Rout	3.5 m	3.15 m
		Thickness	1.2 m	1.1 m
EC CAL	ECAL	Zmin	2.8 m	2.4 m
		Zmax	3.0 m	2.6 m
	HCAL	Zmax	4.2 m	3.7 m
		Thickness	1.2 m	1.1 m

# Exp hall

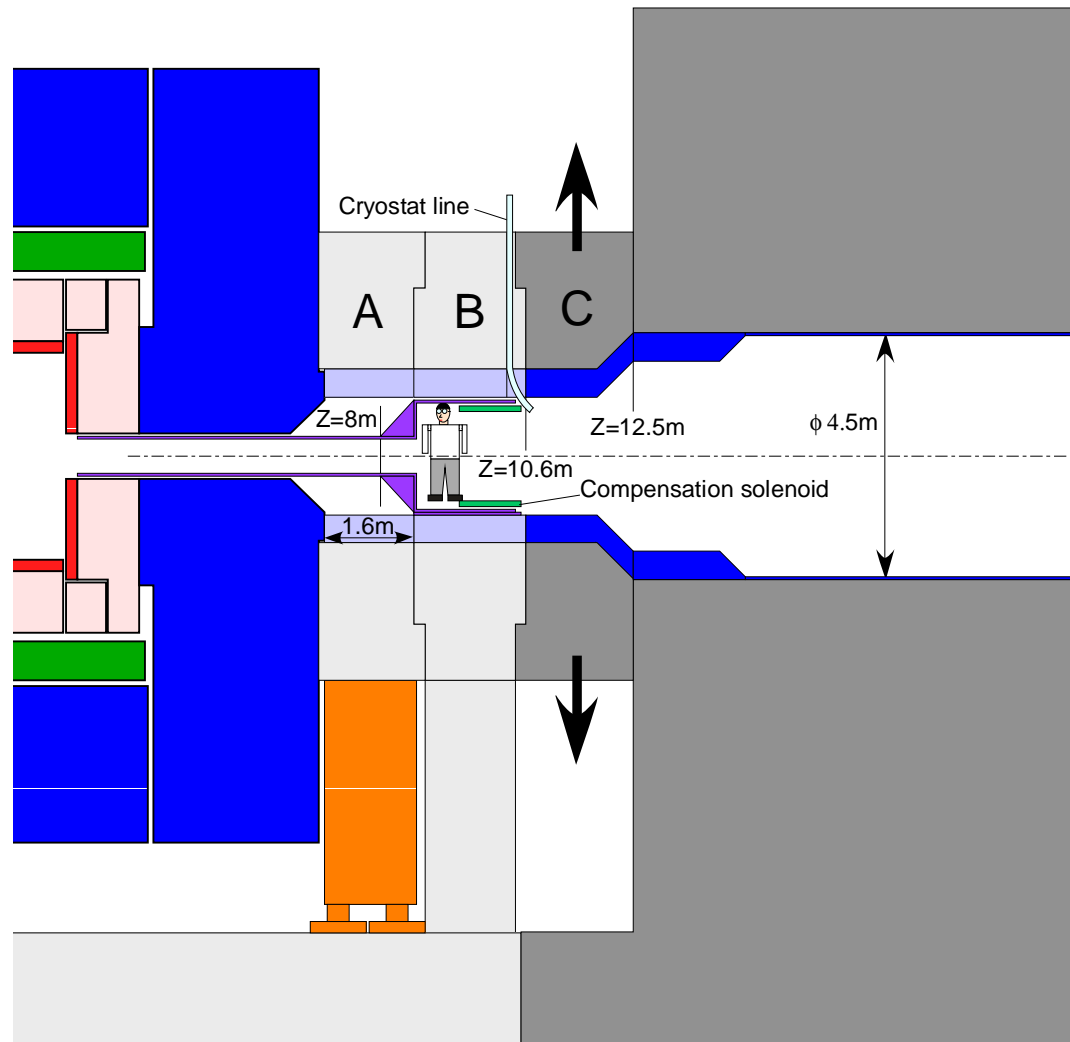


# FD Support / Shield block



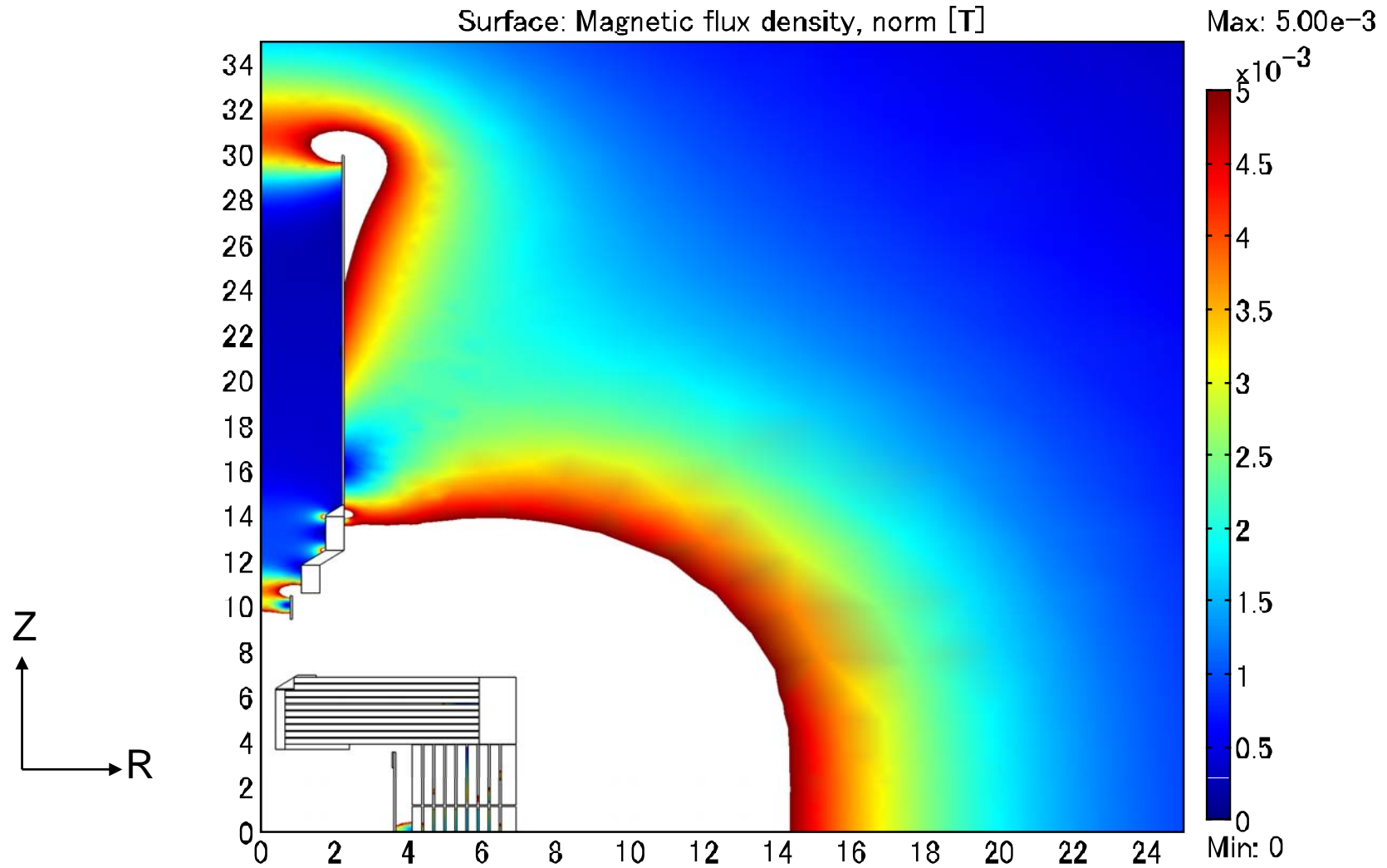


# Shield



- Endcap opening
  - Remove upper part of A by crane
  - Remove lower part of A by air pad
  - Open the endcap
- Push-pull
  - Disconnect beam pipe at  $Z \sim 10.5\text{m}$
  - Slide C vertically
  - Slide the platform

# B-field



# Impact on MDI

- Surface assembly
  - Barrel part (Fe return yoke + Solenoid) is lighter than 6000 ton → Separation into 3 is possible for CMS style assembly
  - Heaviest component to be lifted is upper halves of Fe+concrete shield ~180 ton → Crane capacity: 400 ton → 200 ton
- Push-pull scheme
  - $|Z|$  of the detector is reduced to 6.9 m and only  $\Delta Z=1.6\text{m}$  is necessary to open the endcap
  - BDS cut at  $|Z|\sim 10.5$  m (i.e. after QF1) makes everything easy and quick
  - 22x21 m<sup>2</sup> platform
- Stray B-field
  - Stray field at  $Z=10$  m increases from 70G to 120G, but still can be reduced below 50 Gauss by inexpensive compensation coil and iron shield around beam line
- $L^*$ 
  - $L^*$  of 4.2 m would be adequate