Compact GLD

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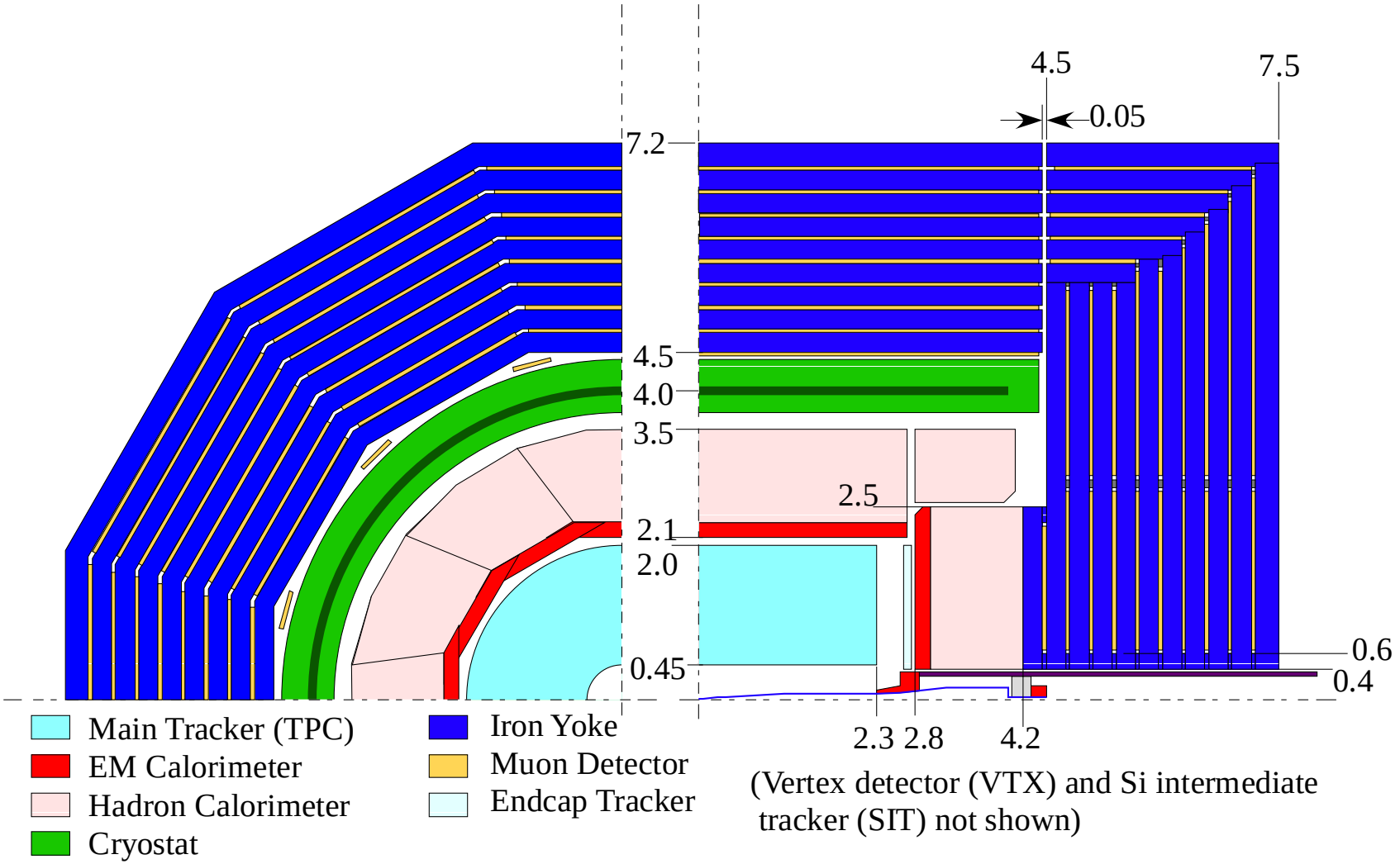
Motivation

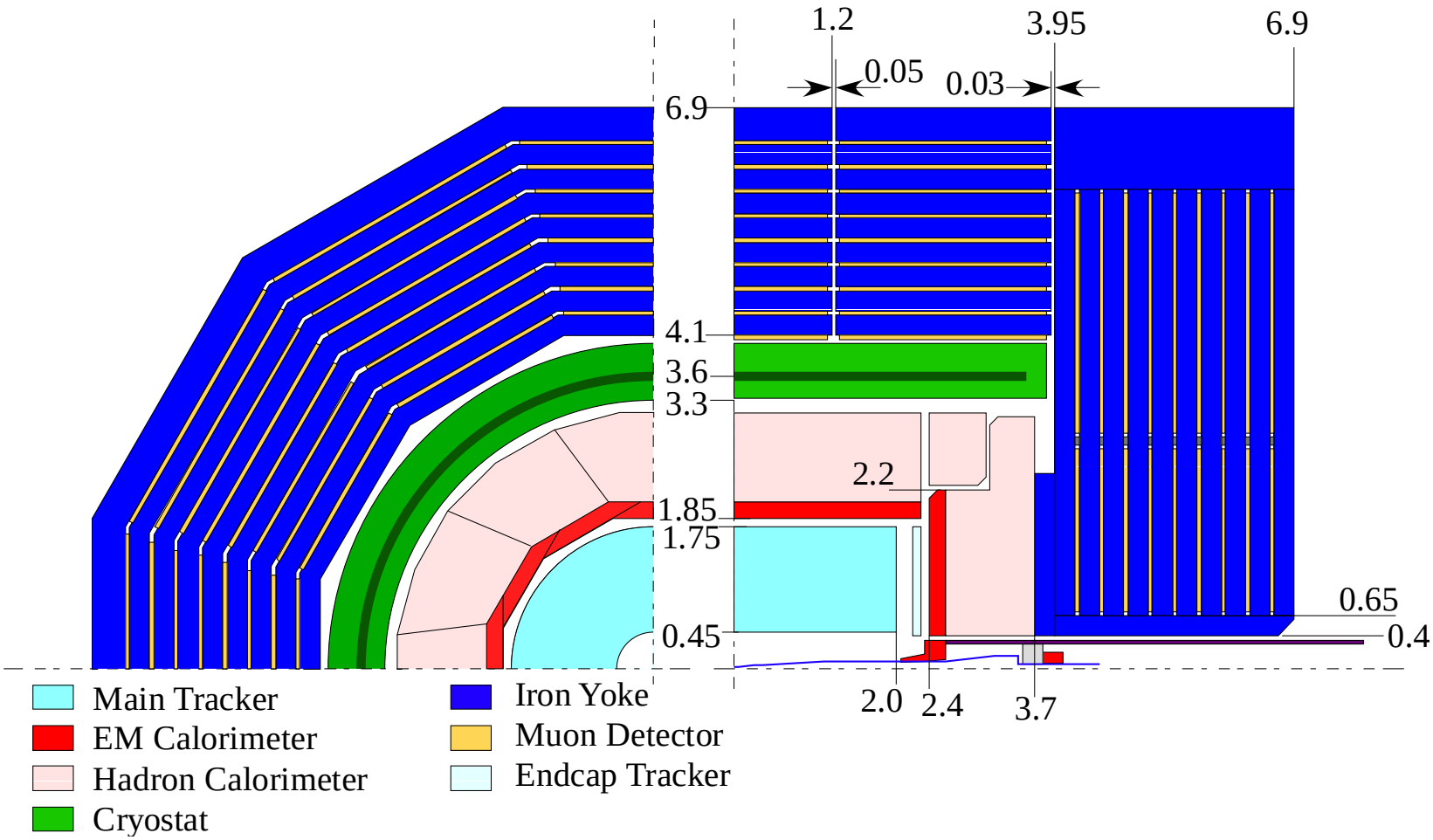
- GLD and LDC will write a common LoI
- The detector design should have common parameters
- Modified design of GLD with the central values for B and R_{CAL} between original GLD and LDC is made
- B=(3+4)/2=3.5 T
- R_{CAL}=(2.1+1.6)/2=1.85 m

Original GLD



(Vertex detector (VTX) and Si intermediate tracker (SIT) not shown)

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
		$BRin^2$	13.2 Tm^2	12.0 Tm^2
	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

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
- Push-pull scheme
  - |Z| is reduced to 6.9 m and only ΔZ=1.6m is necessary to open the endcap
  - BDS cut at |Z|~9 m (i.e. between QD0 and QF1) may be acceptable even if QD0 is supported from the floor
  - 22x21 m^2 platform
- Stray B-field
  - Stray field at Z=10 m increases from 70G to 120G, but still can be compensated by inexpensive coils
- L*
  - L* of 4.2 m would be adequate

Exp hall