

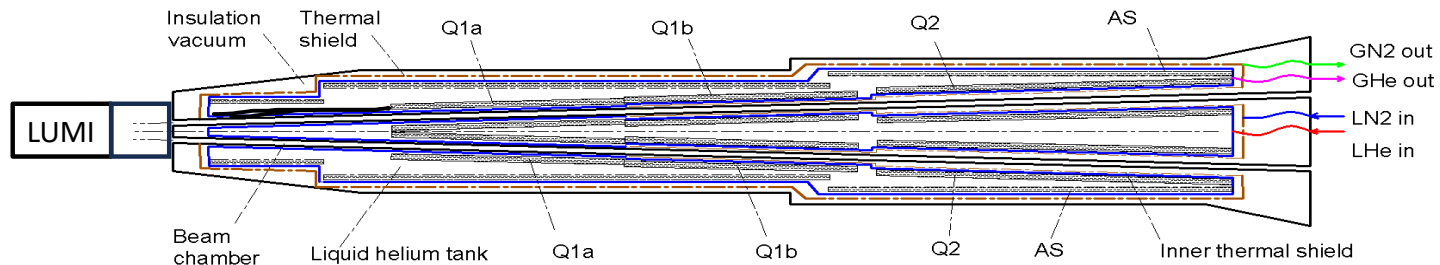
2025.1.7



Status



- Beam induced Background
 - No Shielding version, Higgs + Z(3T) + High Lumi Z(2T)
 - 2nd LYSO of Lumi changed to 800-950mm
 - Change the stainless-steel outside of the magnet coil to Al(10~140mm--> 2)
 - Change the stainless-steel outside of the cryo-module to Ti(10~135mm --> 3)
 - Shielding version(Baseline): Pair + Single(BGB/BTH/BGC/TSC).
 - 10cm Paraffin at both ends of Yoke
 - 10mm outside of the beam pipe between 1115~1900mm
 - 10mm outside of the cryo-module between 1050~7160mm
 - 10mm W between 800~1050mm(outside of Lumi + space between lumi and cryo)

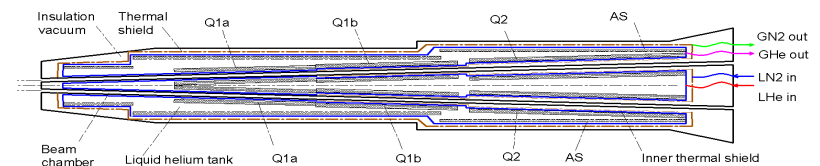




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 - Higgs, Z(3T) and High Lumi Z(2T) first version finished.
 - More BGC Collimators needed, Sha is working on it.





Parameters @ High-Z with 3T



Dou Wang

	Z	
Number of IPs	2	
Circumference (km)	99.955	
SR power per beam (MW)	30	50
Half crossing angle at IP (mrad)	16.5	
Bending radius (km)	10.7	
Energy (GeV)	45.5	
Energy loss per turn (GeV)	0.037	
Damping time $\tau_x/\tau_y/\tau_z$ (ms)	816/816/408	
Piwinski angle	24.2	29.5
Bunch number	11934	13104
Bunch spacing (ns)	23.1 (17% gap)	23.1 (9% gap)
Bunch population (10^{11})	1.4	2.1
Beam current (mA)	806.9	1345.2
Phase advance of arc FODO ($^\circ$)	60	
Momentum compaction (10^{-5})	1.43	
Beta functions at IP β_x^*/β_y^* (m/mm)	0.13/1.0	
Emittance $\varepsilon_x/\varepsilon_y$ (nm/pm)	0.27/5.1	
Betatron tune ν_x/ν_y	317/317	
Beam size at IP σ_x/σ_y (um/nm)	6/72	
Bunch length (natural/total) (mm)	2.5/9.3	2.2/10.6
Energy spread (natural/total) (%)	0.04/0.15	0.04/0.15
Energy acceptance (DA/RF) (%)	1.2/1.7	1.2/2.1
Beam-beam parameters ξ_x/ξ_y	0.0045/0.069	0.0046/0.074
RF voltage (GV)	0.12	0.15
RF frequency (MHz)	650 (1 cell cavity)	
Harmonic number	216720	
Longitudinal tune ν_s	0.035	0.040
Beam lifetime (Bhabha/beamstrahlung) (min)	170/95800	120/932
Beam lifetime requirement (min)	77	81
Luminosity per IP (10^{34} cm $^{-2}$ s $^{-1}$)	50.3	95.2

~1/2



Writing Status



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Backup