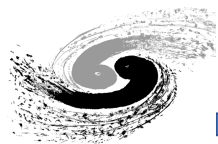


Status of MDI Part of Ref-TDR of CEPC Detector

Haoyu SHI

2024

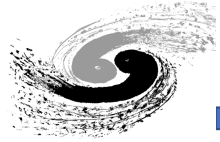


Status – Beam Induced Backgrounds



- BG Simulation using CEPCSoft: Almost Finished except for SR.
 - Results in root file of Histogram2D, higgs/z-pole mode would be available:
 - /cefs/higgs/shihy/work/cepc_bkg/Results/Ref-TDR/20240312/Higgs(Z)/*.root(available when exists)
 - Hit density in number/cm²/BX
 - TID in kRad/yr
 - 1 MeV Silicon neutron eq. flux in number/cm²/yr
 - Z-pole's beamloss was in 3T solenoid, which would be fixed soon.
 - The results from pair could be used as reference, from beam loss should not(too high, more mitigation needed)

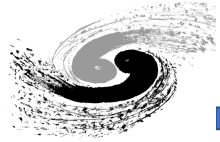
Total.root	BeamLoss.root	BGB.root
		BTH.root
		BGC.root
		TSC.root
	Pairs.root	Paris.root



Status – Beam Induced Backgrounds



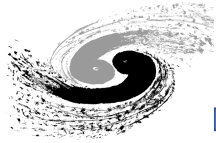
- BG Code migrating to CEPCSW: Hoping before April workshop
 - For fixed geometry, we could offer simulation results in ROOT, and also analysis information similar to CEPSoft(under discussion with detector)
 - For other geometry, the results from generation/tracking could be used as generator(perform the simulation first, then analysis the results. Code ready)
 - Currently, we can get the hit density for VTX using CEPCSW(using the default definition of hit), understanding and dose calculation implementation on going together with geometry implementation.



Status – LumiCal



- Regular Meeting: Tuesday afternoon.
- A discussion was held on last Wednesday, the topic is the requirements and status of LumiCal.
 - The precision requirement from physics kept same as $1e-4$ or even higher, $1e-5$.
 - Therefore, the requirement of the position measurement should not higher than 1 micro. Perhaps the optical survey and monitoring could meet this requirement, more study needed.
 - The crystal part of the design is ongoing, together with the implementation of the geometry into CEPCSW.
 - The design of the silicon part is also ongoing, the help from other silicon detector group may be needed when we figure out the requirements.
 - We may also need novel ideas on the luminosity measurement together with other detectors.
 - The measurement of the luminosity change, and position of colliding is also need(Fast Lumi), this topic will be addressed together with accelerator colleagues.



Status – Overall design/optimization of IR



- A regular meeting with acc. People will be held at Thursday morning, minutes
Link: [CEPC MDI Meeting - HedgeDoc \(ihep.ac.cn\)](https://ihep.ac.cn/HedgeDoc/CEPCMDIMeeting)
- The change of detector size may affect the design of accelerator components like cryo-module.
 - More works would be needed when the size of the detector determined.
 - After that, the detailed work could be performed (like the study on installation/collimation scheme)
- The level of beam induced background is still high at least on Z mode.
 - More mitigation methods like collimators would be needed.