GLD VTX Summary

Y. Sugimoto
KEK
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@Snowmass
Towards the baseline design

• Inner diameter
  – Study of pair background for various machine parameters
    • Beam pipe radius is determined from the consideration of the shape of the pair-background core
    • High Luminosity option requires larger beam pipe radius and $R_{VTX}$ than Nominal option by 5 mm or more for all detector concepts
    • Andrei’s new parameters for High Luminosity option are very preferable from the viewpoint of background. His approach should also be applied to 500 GeV case if possible
  – RVTX impact on physics (by Sonja Hillert)
Critical R&D

- **Sensor R&D**
  - CCD is an established technology, but there are several non-trivial issues
    - Very fine pixel
    - Radiation hardness of fully depleted CCD
    - Multi-port readout
    - Large area sensor
  - First of all, get any sample (\$\$\$)

- **Readout electronics**
  - FPCCD gives signal charge less than 1000 for inclined tracks

**The followings are common to all VTX options/Concepts**

- Wafer thinning and the support structure
- Endplate design
  - Material budget
  - Cabling
- Power consumption and cooling
Homework

• Optimization of layer configuration
  – Super-layers or equi-distance configuration
  – All barrel or with forward disk ← Material budget of endplate for ladders

• More study on the background rejection by hit-cluster shape (effect of $\delta$-ray)

• Study of GLD features to compensate for the disadvantage (larger $R$) of GLD VTX in quark/anti-quark tag
  – Effect of PID ($\pi/K$, leptons)
  – Low momentum tracking