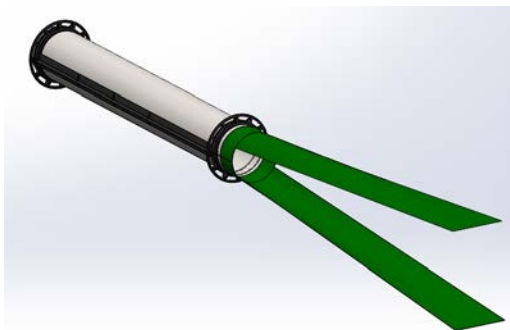


VTX

New baseline 结构方案设计与分析:

- 走线空间受限
- Stiching结构线路引出和探测器支撑与固定

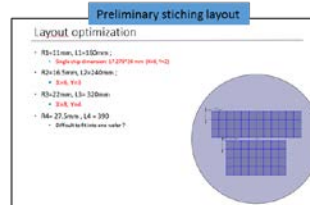


VTX structure - stiching technology based

■ 4 single layer of bent MAPS structure

Many mechanical related issues being discussed and to be studied:

- Wafer thickness VS bent radius
- Wire bond and cable routing?
- shape retaining and connection in Z direction
- Ventilation of air cooling
- Layers integration on the beam



Preliminary structure design of the bent MAPS detector

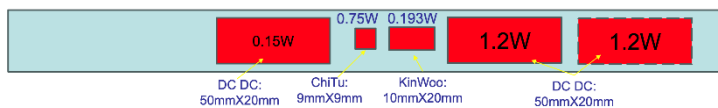
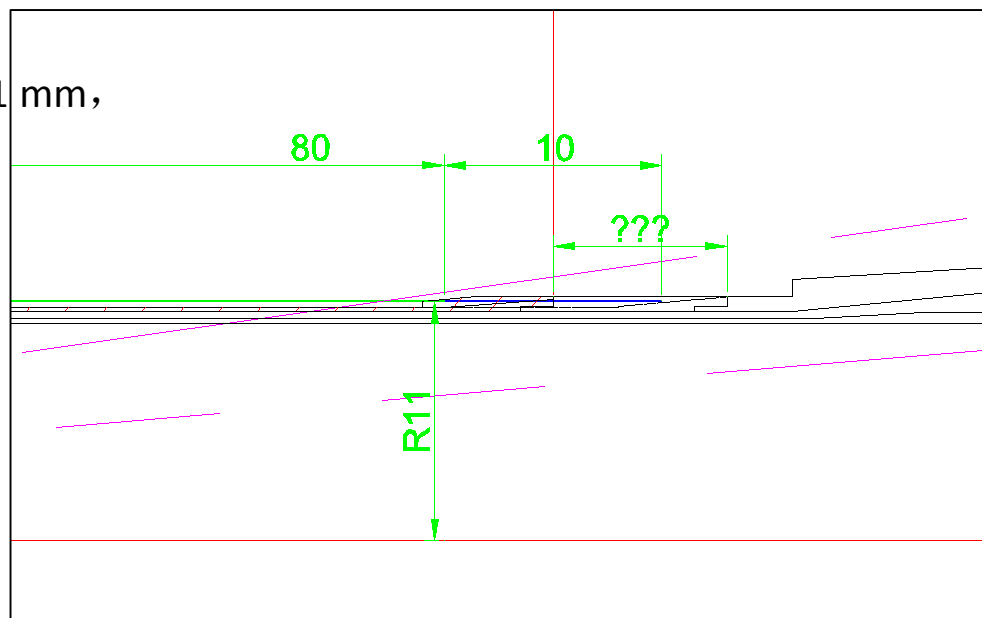


VTX+风道放大腔总体结构模型

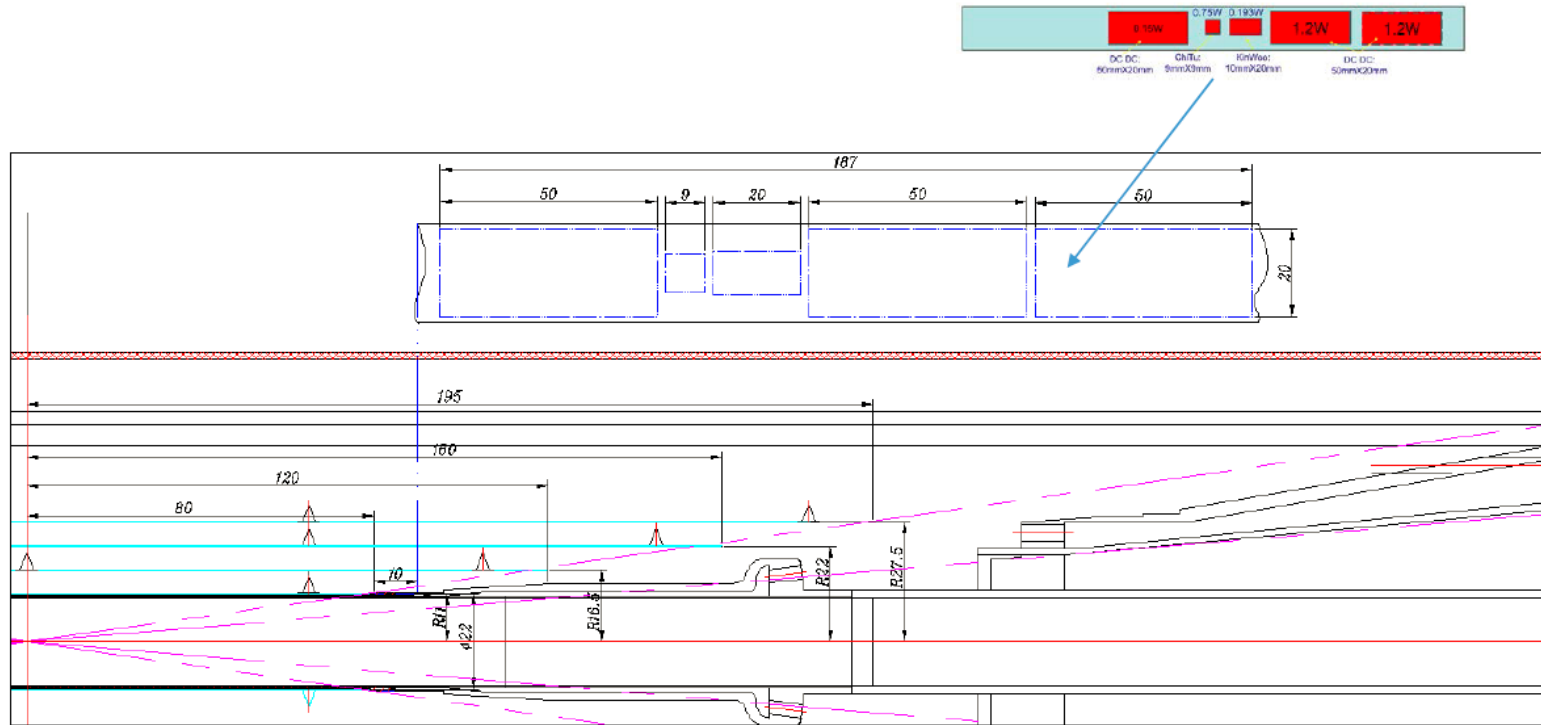


VTX最内层尺寸与束流管对接？

按当前layout：最内层弯曲芯片R11 mm，
与外铍管段干涉。
外皮管可否适当延长？

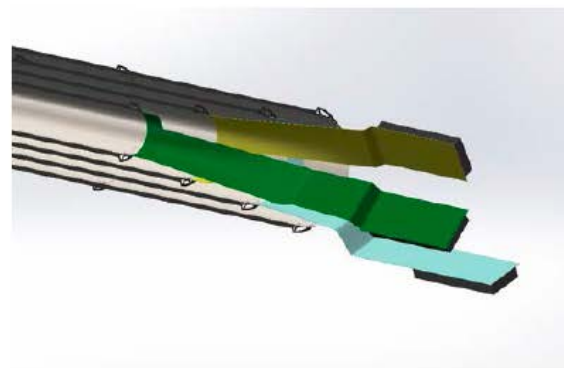
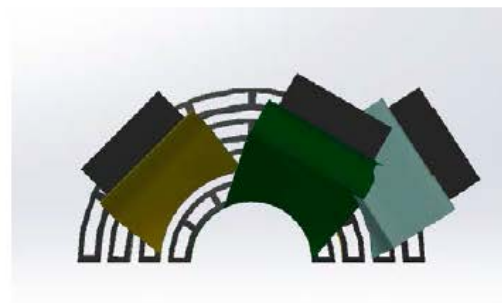
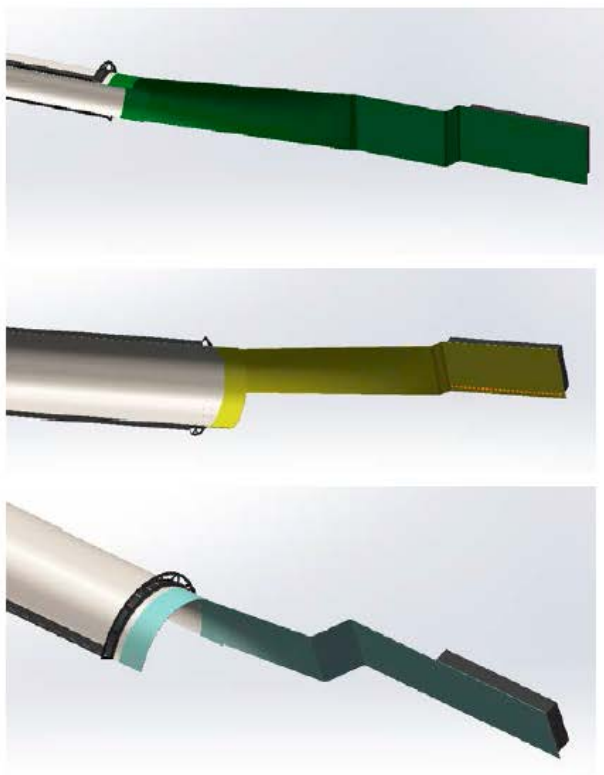


VTX-stiching 走线空间

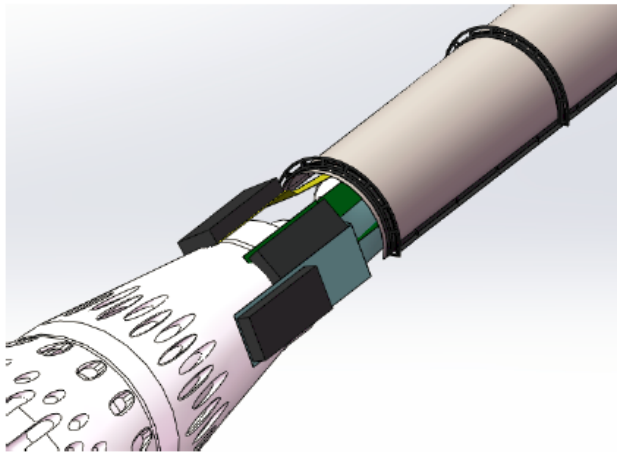
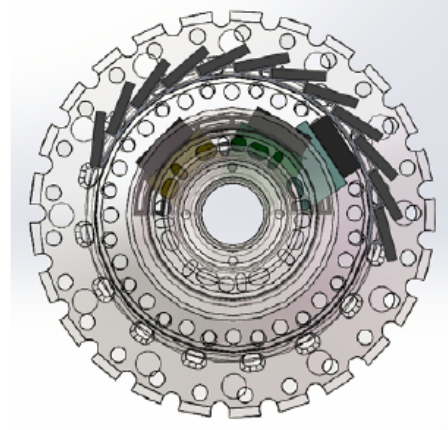
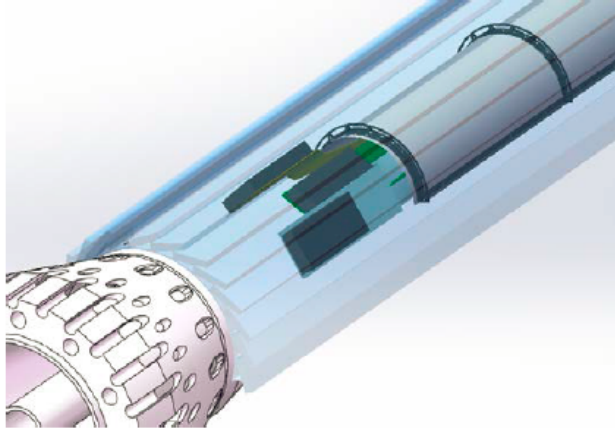


VTX-stiching 走线空间-update

试一个半圆上装一条flex，一个DC-DC 模块50x20x6.7 mm



VTX-stiching 走线空间-update



Stiching可用截面太小:

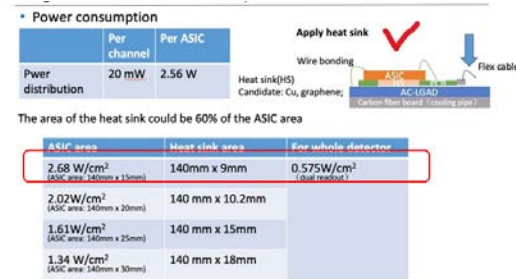
- 相邻层间flex周向有叠加、无间隙
 - 4（示意3层）层的flex+DC-DC径向比较局促、贴近外桶
- 阻挡风道、支撑结构生根受阻

OTK-热分析

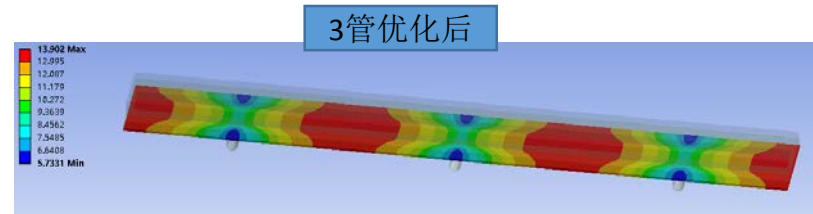
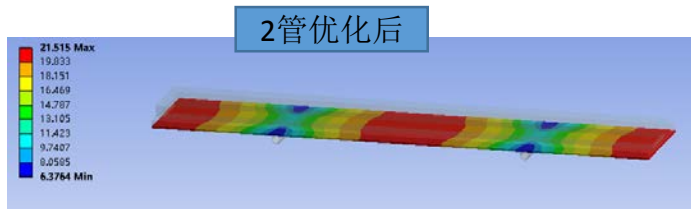
OTK冷却方案优化分析:

之前已对热沉方案采用Cu和AL情况的对比分析，初步结果显示：AL的效果也不错

按新的发热量，按物理需求，调整热沉材料为AL，对不同管路布置做了分析、对比：



ASIC Power: 28.14W (15x140x3 mm)
PCB t=1.6mm
LGAD t= 0.5mm
冷管温度5°C



OTK endcap

按OTK LGAD endcap 物理模块初步方案，设计endcap支撑结构初步方案：

- 前后petal交替
- LGAD朝向IP
- / 电子学方案
- / 冷管布置

探测器R 400-1800 mm，整体R边界？

Endcap design

- Hit rate estimation: maximum $\sim 35\text{ k Hz/cm}^2$
- Update the sector module design with new HS design
- 400mm - 1800mm: 720 modules
 - ✓ 5 inner rows with 1 sector module
 - ✓ 5 out rows with 2 sector modules

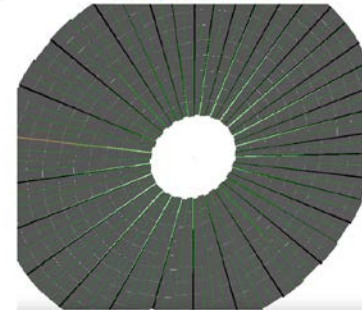
Sector Module



- Overlap to reduce the dead area
 - ✓ 24 petals/layer
 - ✓ 10 rows/petal.
 - ✓ 7.5° per petal.
 - ✓ Overlap 0.5°/petal

○ 140 mm / row at R direction

Endcap design in the CEPCSW



Endcap 初步结构方案

