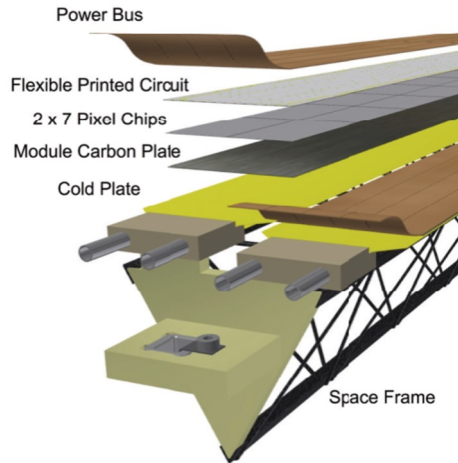# CEPC Silicon Tracker Progress Report (16)

Qi Yan *on behalf of the Silicon Tracker Group*
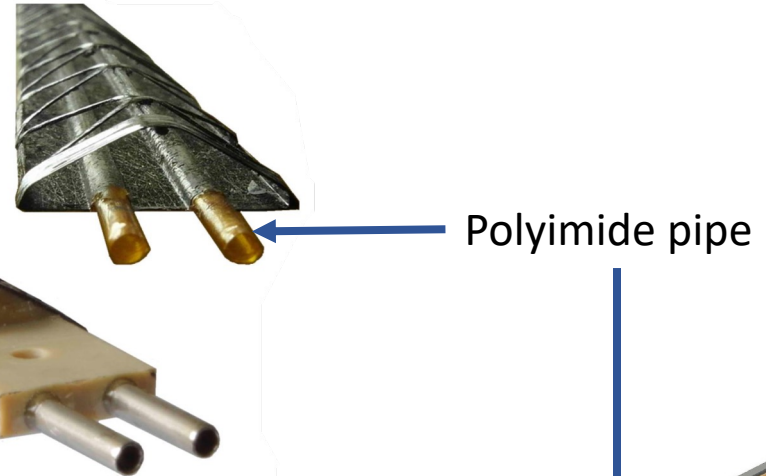
Dec 24, 2024, IHEP

Improvement of the ITK Stave Support and Cooling Design
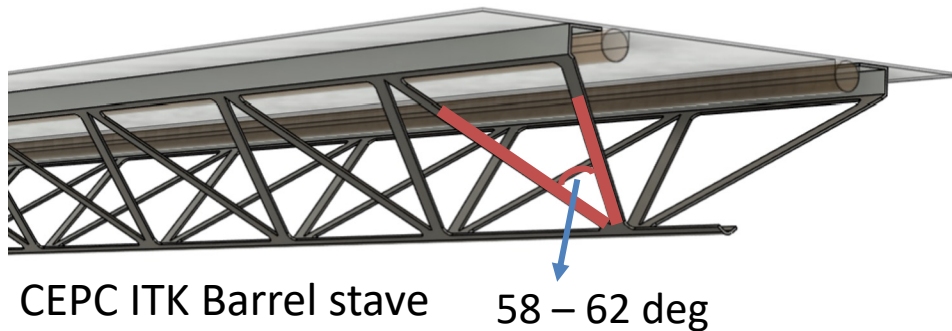
ITS2 Outer Barrel stave

ITS2 Inner Barrel stave

Power Bus

Flexible Printed Circuit

2 x 7 Pixel Chips

Module Carbon Plate

Cold Plate

Space Frame

Polyimide pipe

Yujie Li, Quan Ji, Yihan Zhang, and Qi Yan

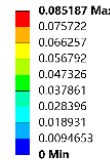CEPC ITK Barrel truss

CEPC ITK Barrel stave

58 – 62 deg

Water with polyimide cooling pipe was used as cooling medium for the ITK.
Polyimide possesses outstanding properties such as low mass, high temperature resistance, corrosion resistance, radiation resistance, and high strength.

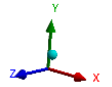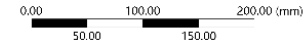# ITK Stave Deformation and First Natural Frequency
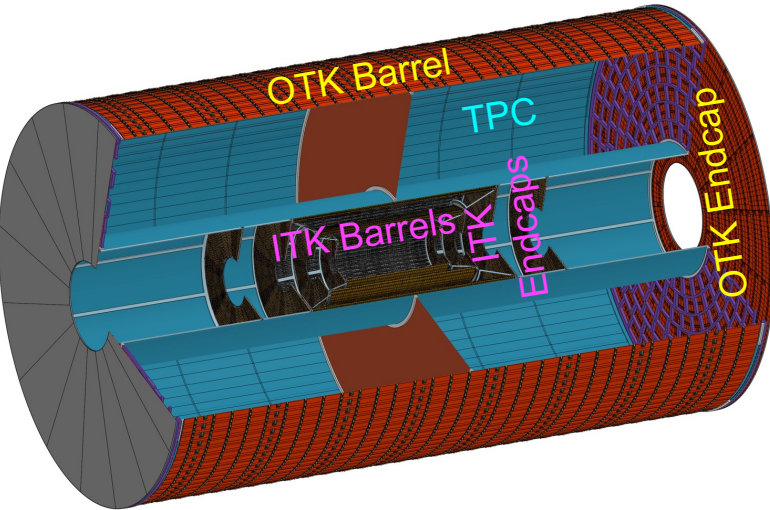
ITKB1 stave deformation

Yujie Li and Quan Ji
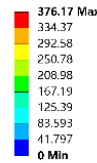
First order mode and first natural frequency
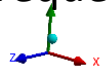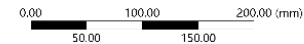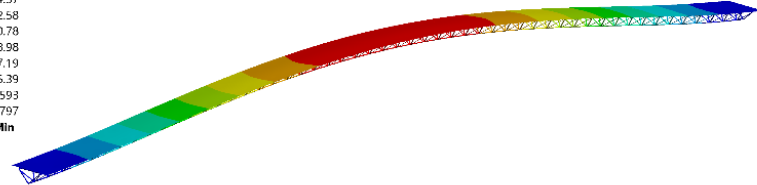
ITK Stave	ITKB1	ITKB2	ITKB3
Stave length [mm]	987	1410	1974
Maximum sag [μm]	85	289	896
First natural frequency [Hz]	126	69	34

The first natural frequency indicates the frequency at which an external impulse can induce resonance phenomena in the structure, resulting in oscillations of the sensor positions.

Ongoing Tasks for the Silicon Tracker TDR (Highlighted in Blue)

We are working on!

Plan for the Silicon Tracker Ref-TDR

We need to converge on the writing of the Silicon Tracker Ref-TDR:

- Starting this Friday, regardless of the current progress, our group meeting will begin weekly global readings, reviews, and revisions of the Silicon Tracker Ref-TDR.

- From next week, I will start systematically revising the entire chapters of the Silicon Tracker Ref-TDR.

- The following topics will be strengthened:
  - ➤ Overview of ITK and OTK
  - ➤ Mechanical and thermal analysis of the endcap
  - ➤ Background estimation
  - ➤ Performance