EIC Beamline R & D Status

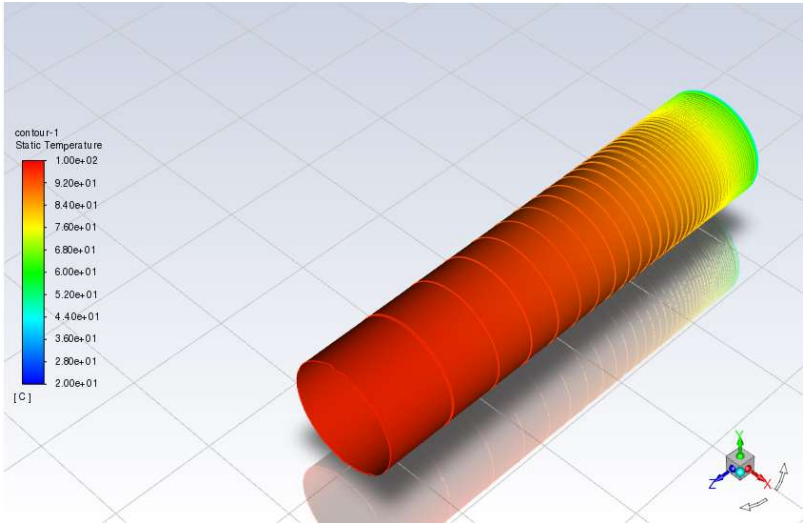
Detector Support Group
February 15, 2023

February 15, 2023

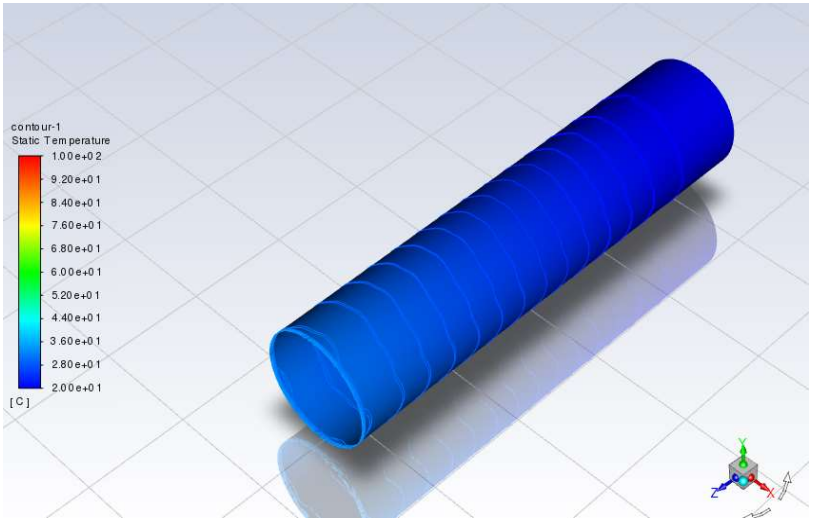
EIC

Brian Eng and Pablo Campero

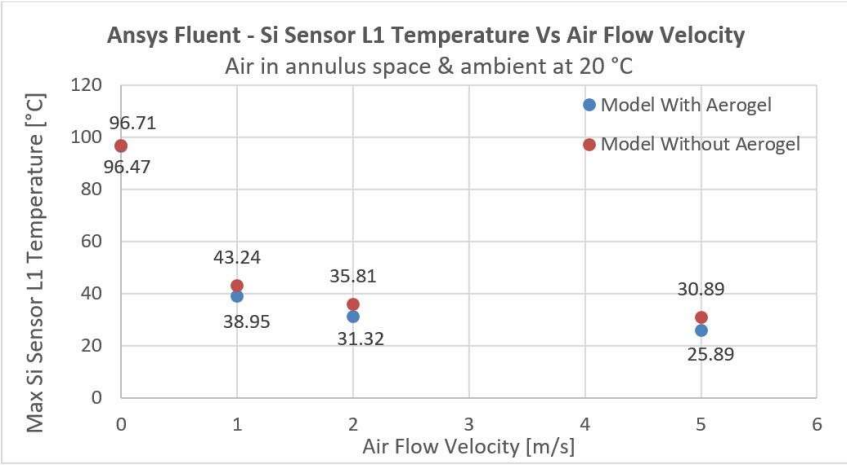
- Met with LBL Mechanical Designers about possibility of contributing to silicon design
- Modified beampipe 3D model, imported model to *Ansys Fluent,* and configured for thermal analysis
- Ran simulations with different aerogel properties to see effect on silicon sensor layer 1 temperature
  - ✶ Changed density from 50 to 250 Kg/m^3
  - ✶ Used two values for thermal conductivity (cp = 0.0156 and 0.0140)
  - ✶ Only change in thermal conductivity affects silicon sensor layer 1, by 1°C
- Ran five simulations to check maximum temperature of silicon layer 1, varying air flow velocity in the annulus space and enclosure from 0 to 5 m/s and temperature constant at 20°C



Model with aerogel and 5 mm separation between the beryllium pipe and silicon sensor layer 1; air flow velocity of 0.001 m/s



Model with aerogel and 5 mm separation between the beryllium pipe and silicon sensor layer 1; air flow velocity of 2 m/s



Temperature vs velocity for 5 mm separation model, with and without aerogel