Mu2e-II Tracker Workgroup Brief Report

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Sept 23rd, 2020

- Mu2e-II Tracker Workgroup
- Ongoing R&D

Prototype 8 μm Mylar Straws

Tracker Working Group:

- **Conveners :** Gianfranco Tassielli, INFN

    Dan Ambrose, UMN

- **Members :** Brendan Casey, FNAL

    Mete Yucel, FNAL

    Manolis Kargiantoulakis, FNAL

    Dave Brown, LBNL

Join the list-serve : MU2EII-TRACKER@fnal.gov

Soon to have a slack channel.

Meeting Schedule : Bi-weekly Tuesdays 11:00 AM CST. Next one is Oct 6th.

Zoom link sent through list-serv

We would gladly welcome more interested people.

Please contact Gianfranco, me, or come to the workgroup meeting

Tracker LOI :

Read at:

https://www.snowmass21.org/docs/files/summaries/IF/SNOWMASS21-IF0_IF0-RF0_RF0_Daniel_Ambrose-094.pdf

Outlines R&D being investigated, both with an improved straw-tube tracker and other tracking technologies.

Update LDRD Research : Straw Tests

- **First test batch of 8 μm straws made.**
  - **Made from unmetalized Mylar**
    - **Two 3 μm mylar layers with 2 μm adhesive**
  - **Holds 30 PSI gauge pressure**
    - **No noticeable deformation at 30 PSI**
  - **Being tested for mechanical properties**
    - **Subjected to linear tension and inflation pressure**
    - **Measure material creep**
  - **Understanding handling the material**
- **Moving toward second batch**
  - **Metalized Mylar to be used**
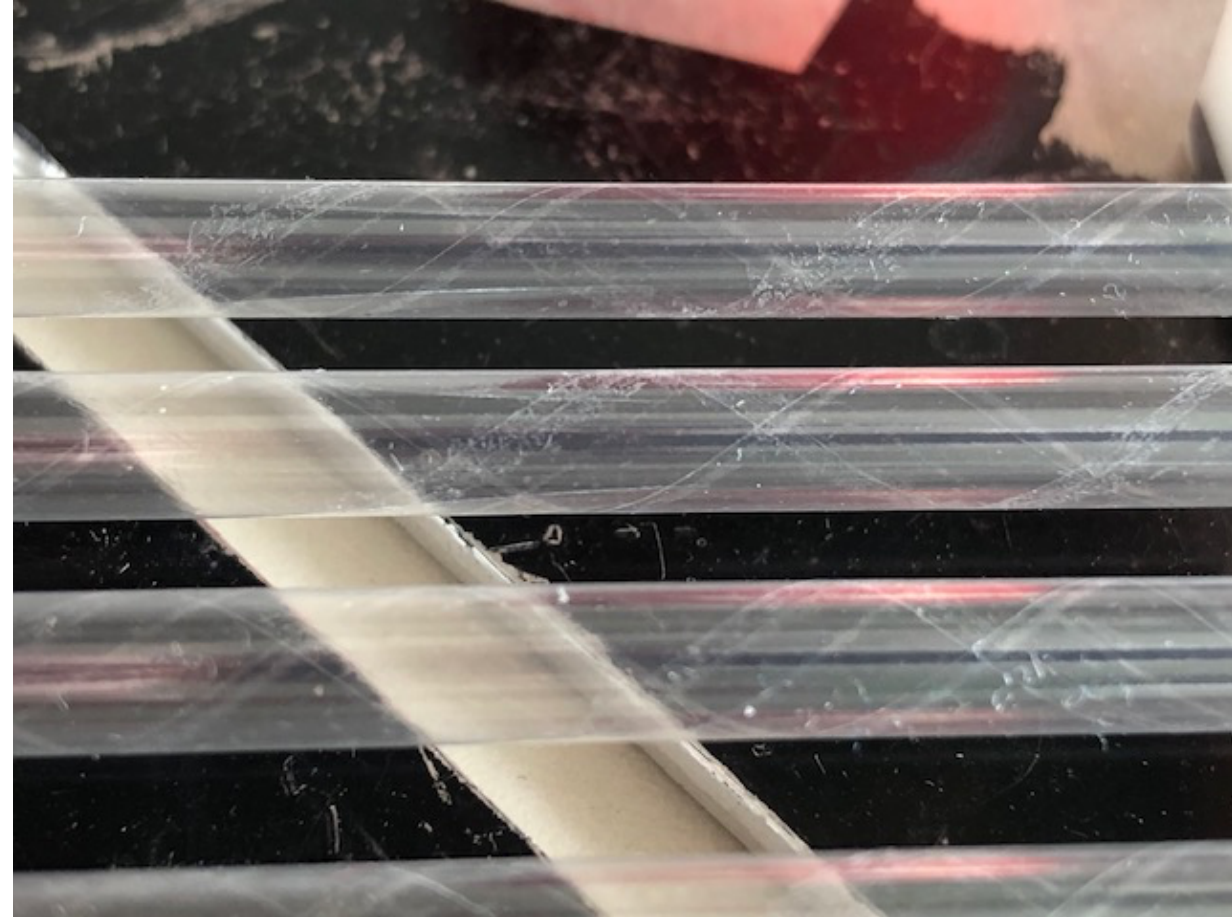
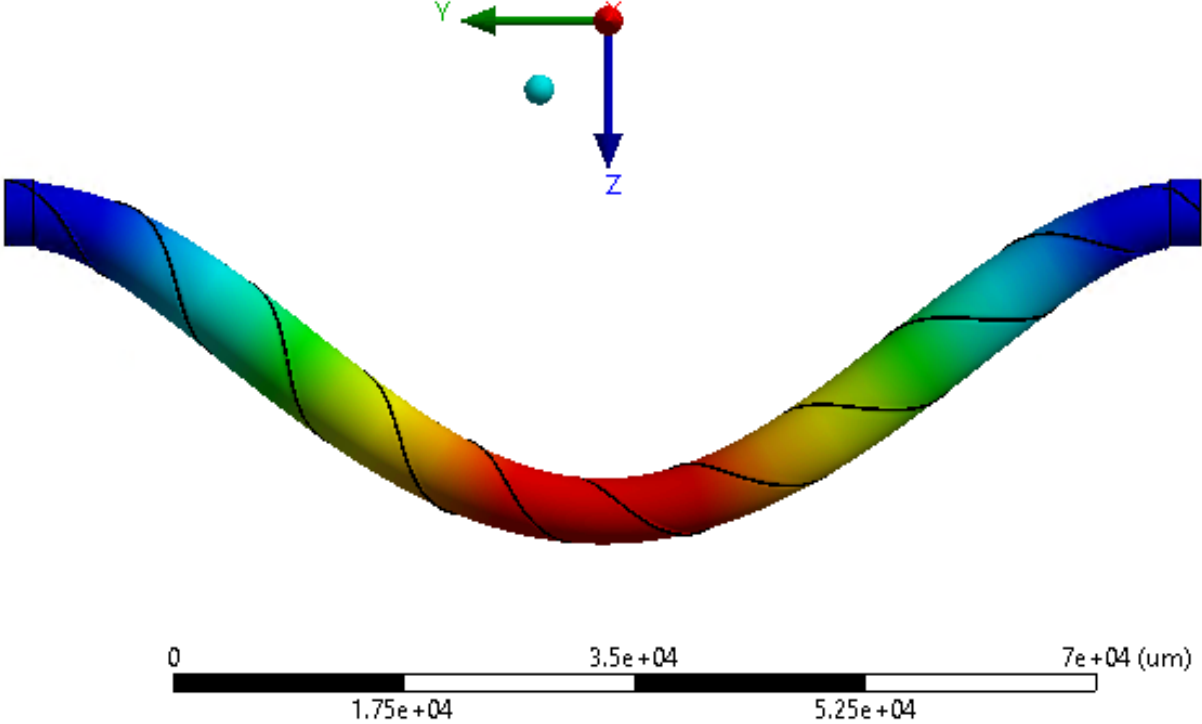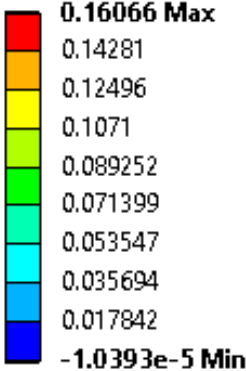**Pressurized 8 μm Mylar Straws**

3D simulations of 8 μm straws

Erik Voirin

Progressing on simulating straw to estimate mechanical properties properties.

Comparing simulated straw properties to prototypes.

B: Single Spiral
Directional Deformation
Type: Directional Deformation(Z Axis)
Unit: μm
Global Coordinate System
Time: 1
8/17/2020 11:33 AM

0.16066 Max
0.14281
0.12496
0.1071
0.089252
0.071399
0.053547
0.035694
0.017842
-1.0393e-5 Min

0   1.75e+04   3.5e+04   5.25e+04   7e+04 (um)

Tracker Simulations:

Dave Brown is working on adapting the FastSim model used in SuperB studies.

In FastSim, the particle material integrations are modeled with simplified cross-sections and formulas.

xml files allow quick modification of detector geometry and material.

One goal is to use FastSim to estimate what intrinsic drift time resolution needed to exploit the reduced tracker mass.

Conclusion

- **Continuing research on constructed straws with 8 μm wall thickness**

- **Developing simulations of straws**

- **Looking to use FastSim software to explore changes in geometry and material in the detector.**

Contact us to get involved and if you are interested in joining the tracker group.