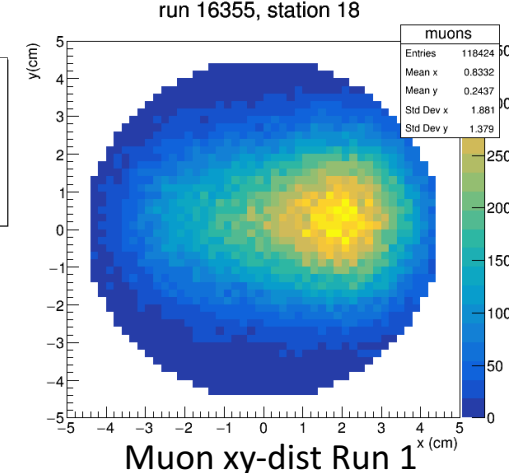
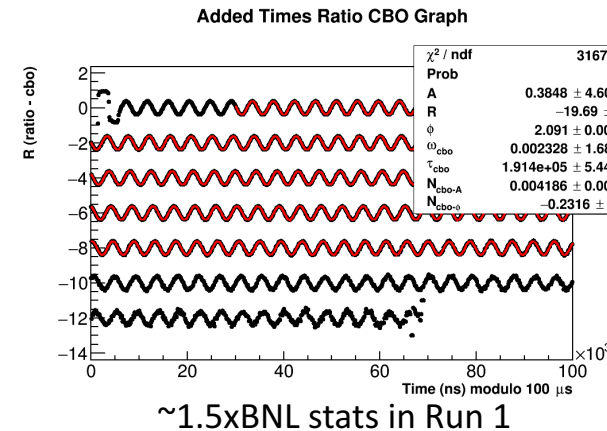
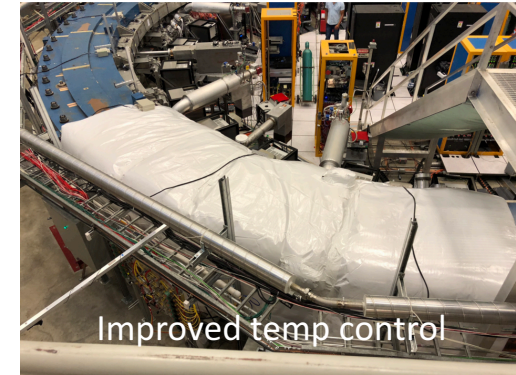
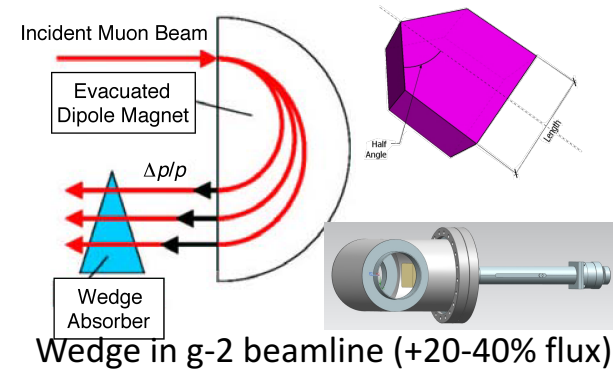
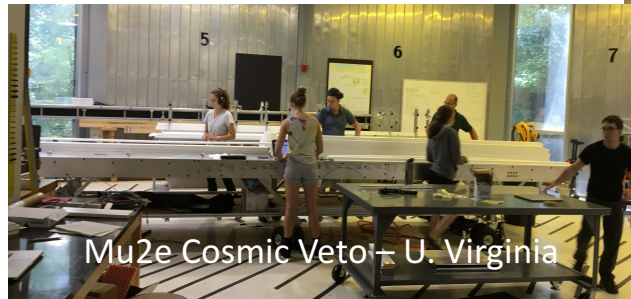


Progress for Precision Science

D. Glenzinski, C. Polly

SAC Meeting, October 2018

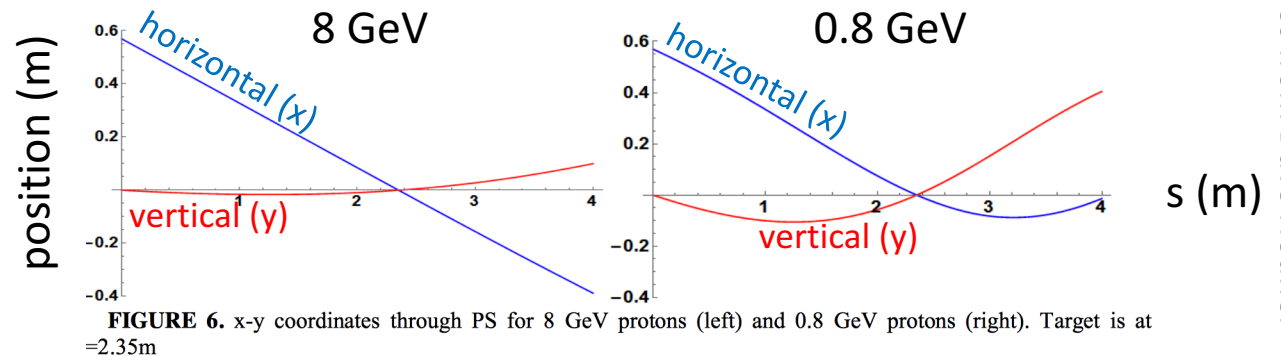
Precision Science April Output



- Precision Science Action Items from April:
 - Advance R&D plans for Mu2e-II
 - Communicate Mu2e-II to broader community
 - Explore ideas for additional future experiments on the Muon Campus

Mu2e-II Progress since April

- June : Directorate initiated a Task Force charged with developing a conceptual design for the Mu2e-II proton beam line and target
 - Chairs: S. Werkema, R. Zwaska
 - Main challenges: beam trajectory & 100 kW-capable target
 - Final report due early 2019



Figures from Dave Neuffer

- July : Mu2e-II Expression of Interest was presented to FNAL PAC

The PAC recognizes that the physics case of a factor of ten sensitivity improvement is compelling for all scientific outcomes of a successful (in terms of reached sensitivity) Mu2e experiment

The PAC recommends the Mu2e-II proponents to identify the most relevant and urgent R&D items for the detector. The PAC endorses the Mu2e-II request of dedicated R&D funding and encourages them to engage the Laboratory and funding agencies into identifying the required resources.

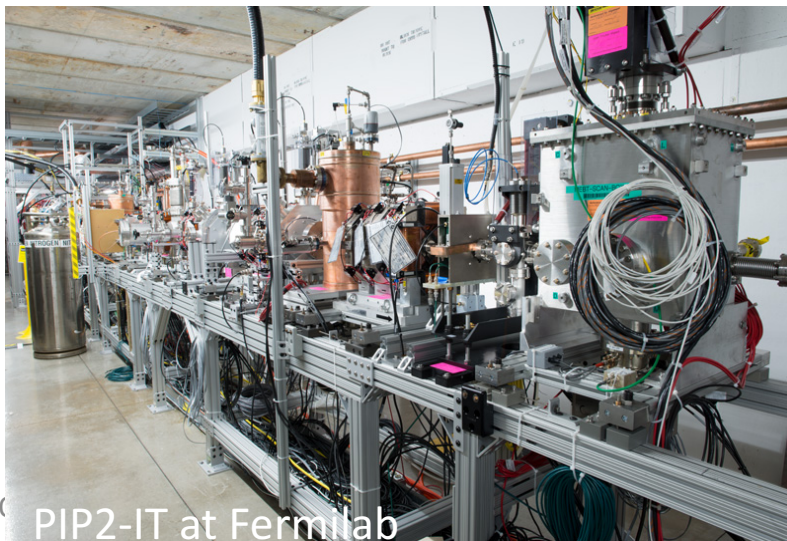
Mu2e-II Progress since April

- August : A Mu2e-II Workshop was held at Northwestern University

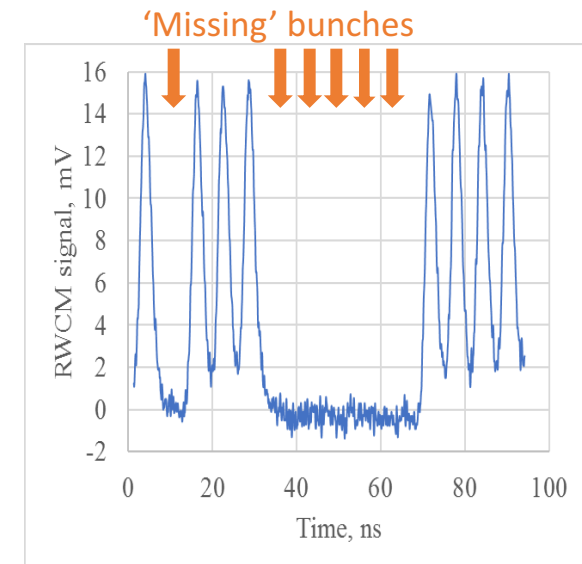
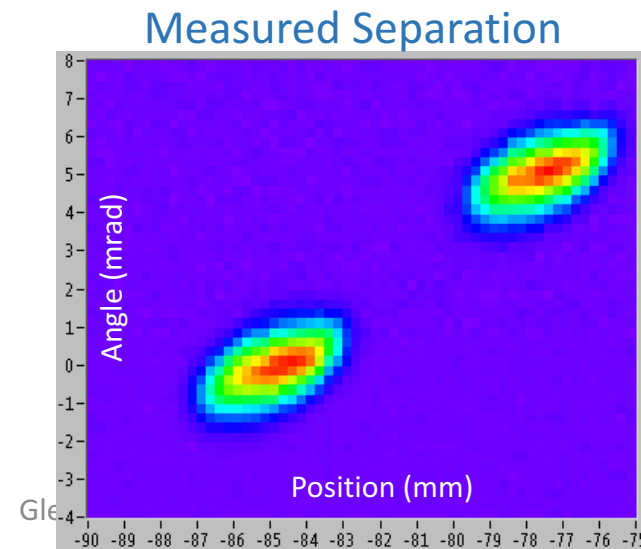


- 77 participants
- Enumerated R&D tasks & objectives
- Summary Report in preparation

- September : Developed proposal to measure extinction performance of the beam chopper using PIP2IT – important for Mu2e-II



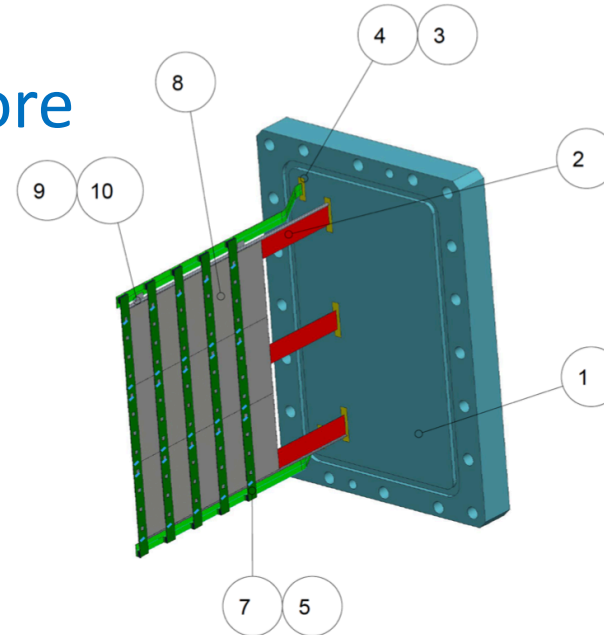
29 (PIP2-IT at Fermilab



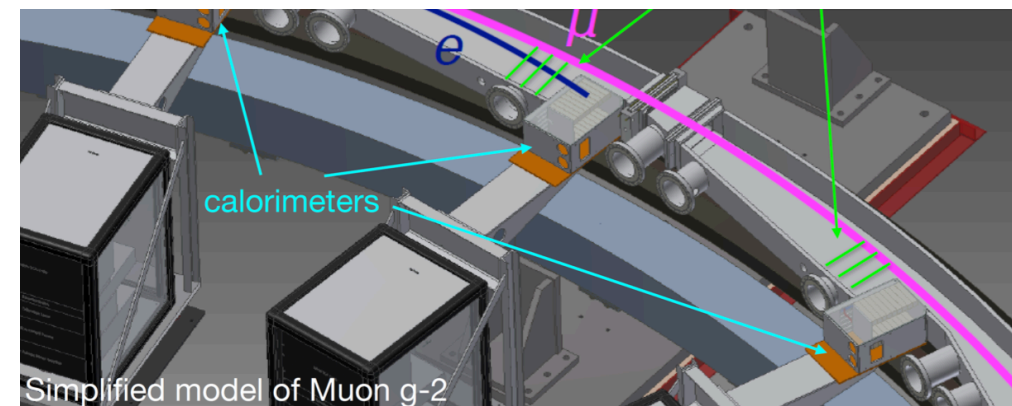
Muon EDM Progress since April

- **October: Workshop held in UK to explore preliminary design and sensitivities**

- Strawman design to distribute Si-based trackers in front of all 24 calorimeters
- Sensitivities
 - Current E821 limit: $1.8 \times 10^{-19} e \cdot \text{cm}$
 - Projected E989 limit: $3.0 \times 10^{-21} e \cdot \text{cm}$
 - 2 year run with new sensors: $5-10 \times 10^{-22} e \cdot \text{cm}$
- Prototyping and testing through FY22
 - Will learn if there is systematic floor in E989
- Full deployment by FY23 possible



ITEM	PART/CAD No	QTY
1	FLANGE	1
2	HEAT-PIPE	3
3	ISOLATOR	3
4	ISOLATOR2	2
5	KAPTON1	5
6	KAPTON2	2
7	KAPTON3	2
8	SILICON_TILE	15
9	STIFFNER	2
10	STIFFNER2	2
11	TPG_WEDGE	5



Next Steps

- **November** : Ensure our plans are adequately represented in DPF White Paper submission to European Strategy Group
 - Have been working with the lead writers for the Intensity Frontier, Detector R&D, and Accelerator sections.
- **December** : Mu2e / Mu2e-II is submitting a joint White Paper to the ESG describing a global plan for CLFV using muons
 - Have met with relevant spokespersons several times... next meeting 30-Oct
 - Rough draft in hand... aim to provide mature draft to relevant laboratory directorates by mid-November
 - On track for mid-December submission
- **January/February** : Discuss detailed, prioritized Mu2e-II R&D plan with Fermilab directorate
- **Muon EDM**
 - FY19/20: E989 initial analysis, prototype construction and testing, explore optimal funding strategy (STFC, NSF, OHEP), develop full proposal