Brief Update
Theory

Julian Heeck

Mu2e-II Snowmass21 Workshop IV

9/23/2020

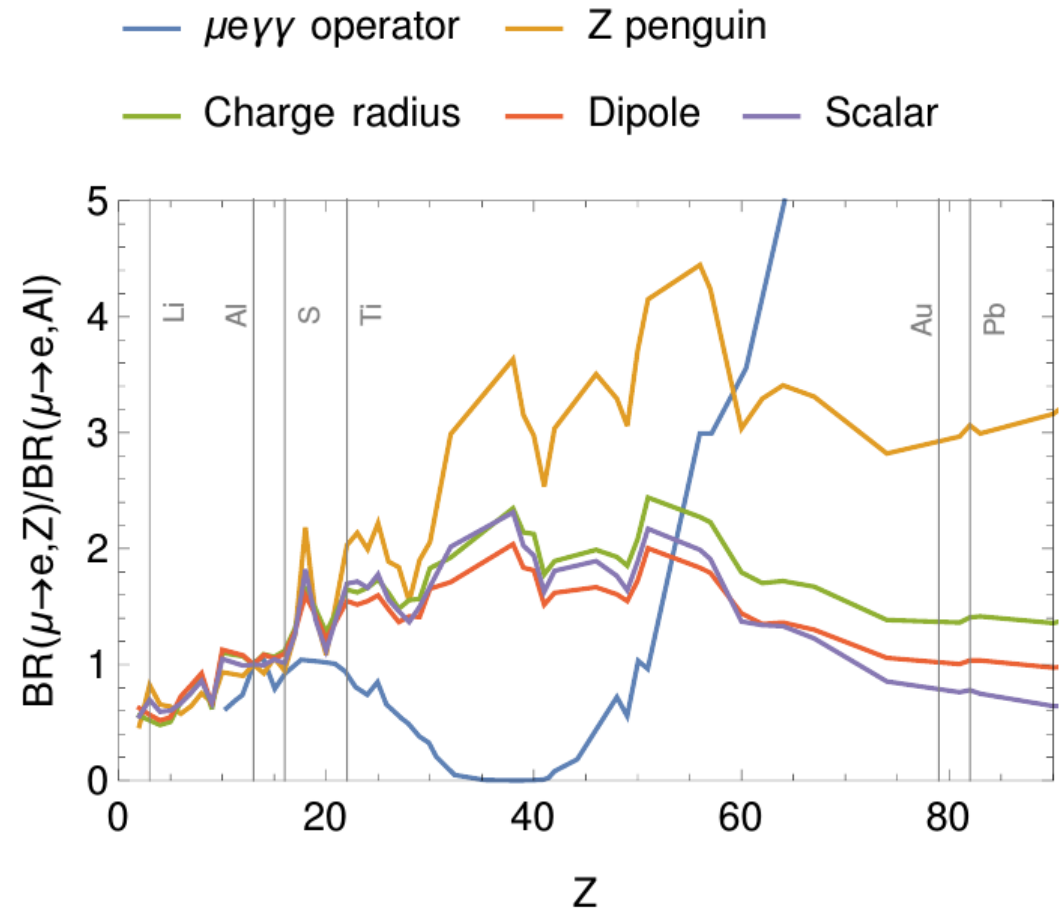# Theory working group

- Julian Heeck (University of Virginia)

- Lorenzo Calibbi (Nankai University)

- Members: *(new!)*

    – Robert Szafron (CERN, soon BNL)

- Mailing list: mu2eii-theory@fnal.gov
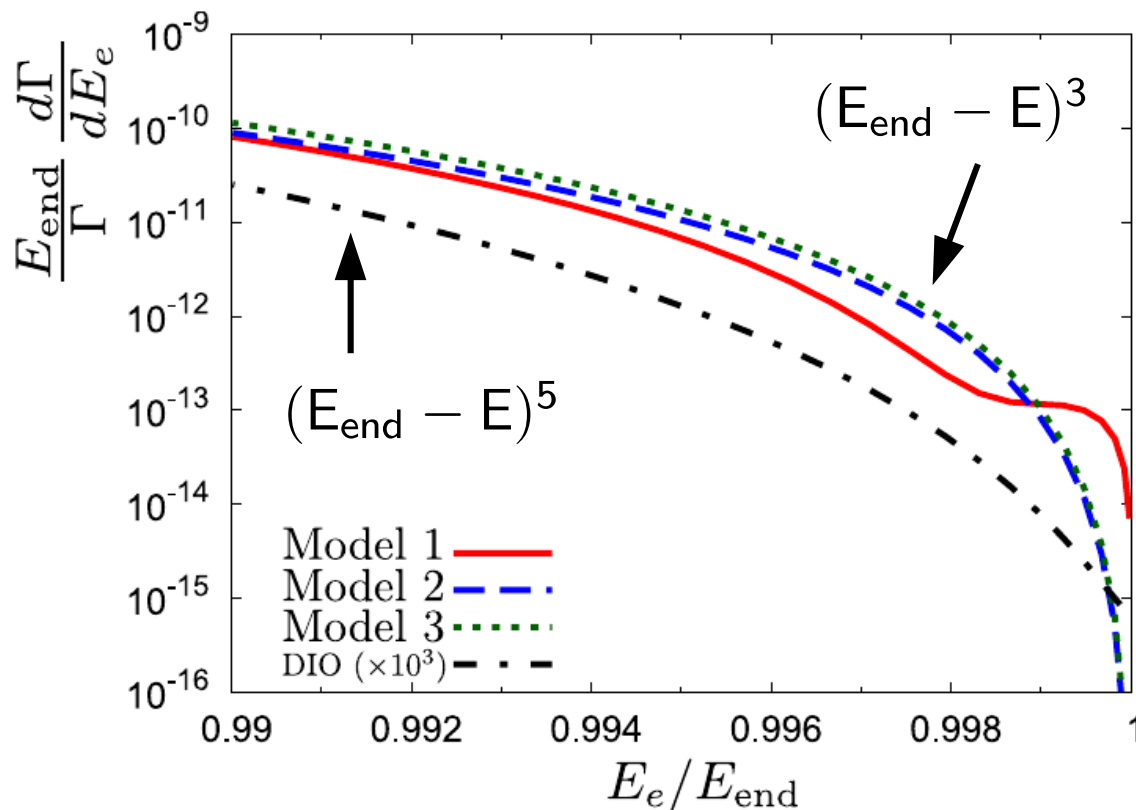
Comments, questions, and members welcome!

Goal 1: Stopping target

- Working with Robert to evaluate current accuracy of DIO spectrum for Al, Ti, & Li.

- Hand over to sensitivity group for simulation.

Goal 2: μ→e X in Mu2e(-II)

- μ→e X in bound muon produces tail up to E_e ~ 105 MeV.

- Different tail shape! Depends on X spin. [Uesaka '20]

- Working with Uesaka to get μ→e X spectra for all targets of interest.
- Give to sensitivity group…
- Find best energy window (RMC background!).
- Compare strategy to Kuno's COMET approach.

[Kuno, Wu, Xing, LOI '20]

Summary

- Collecting/deriving relevant spectra for sensitivity group.

- Thinking about $\mu^- \to e^+$ models and necessities.

- Eventually: find good benchmark models for Mu2e-II; aim to predict conversion rates by linking to existing anomalies.

- Have been invited to present LOI at RF meeting (10/2)!

Comments welcome!