Brief Update
Theory

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Mu2e-II Snowmass21 Workshop (iii)

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Theory working group

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Comments, questions, and members welcome!

Theory challenges and opportunities of Mu2e-II: Letter of Interest for Snowmass 2021

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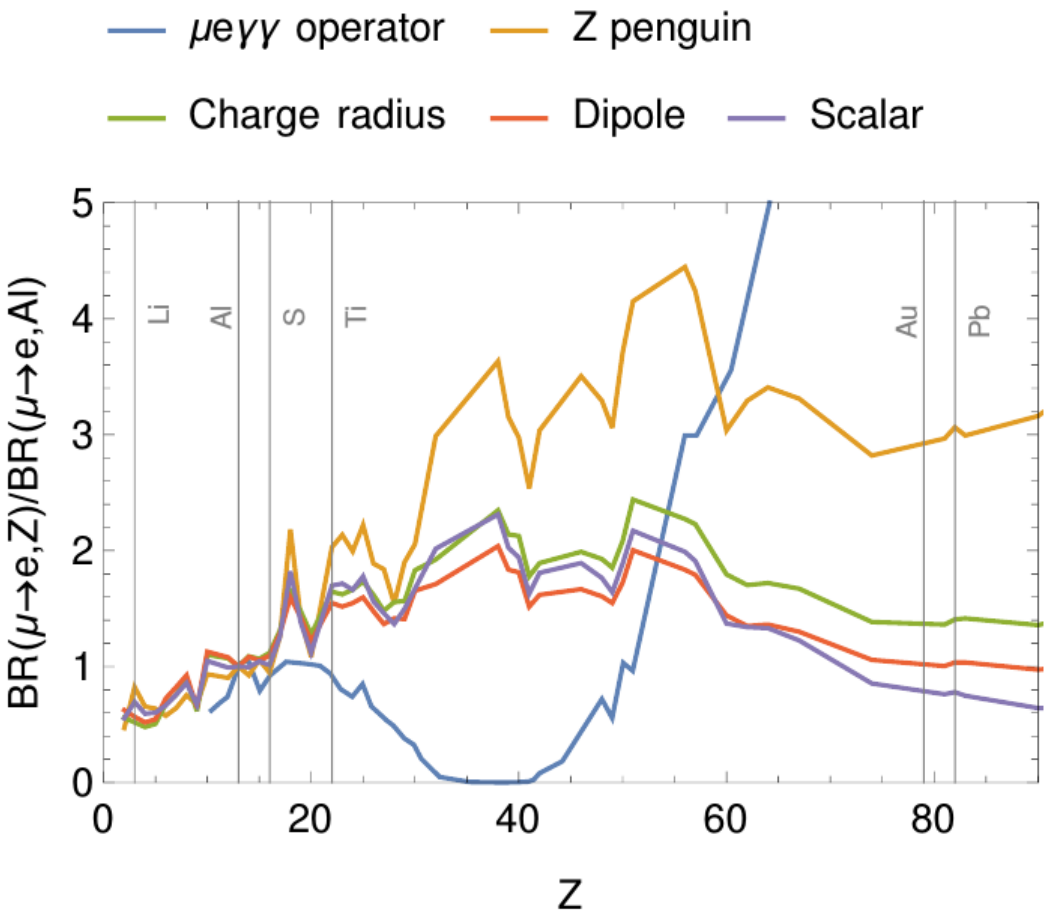
- Link to pdf: https://www.dropbox.com/s/kyo3wjlen4vkcf4/LOI_Mu2e_II_theory.pdf
- Please let us know if you want to sign this LOI.
- Plan to submit to RF5: CLFV and TF06: Theory techniques for precision physics.

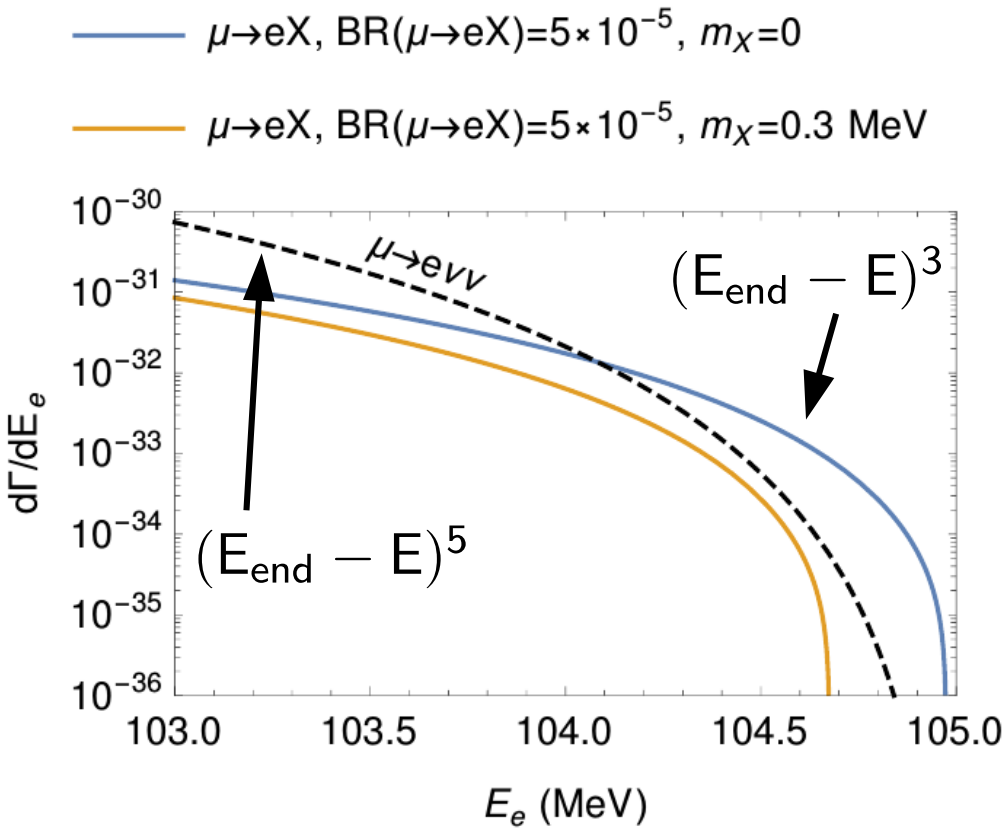
Goal 1: Stopping target

- Al + heavy = best.
- Al + Ti = good for spin dependence.
  [Davidson, Kuno, Saporta ‘18]
- Al + Li = good for p vs n.
  [Davidson, Kuno, Yamanaka ‘19]
- DOI spectrum and nuclear matrix elements precise enough for all these nuclei?
- Experimental considerations?



Goal 2: μ → e X in Mu2e(-II)

- μ → e X in bound muon produces tail up to E_e ~ 105 MeV.
  [Tormo, Bryman, Czarnecki, Dowling '11]
- Different tail shape!



- Fit background shape to reveal exotic contribution?
- Strong suppression from tail, still competitive?
- Spectral features due to quantum numbers of X? [Uesaka '20]

Summary

- Encouraging feedback on LOI, international interest!
- Will reach out to potential working group members.
- Established contact with Sensitivity group, main liaison.

Comments welcome!