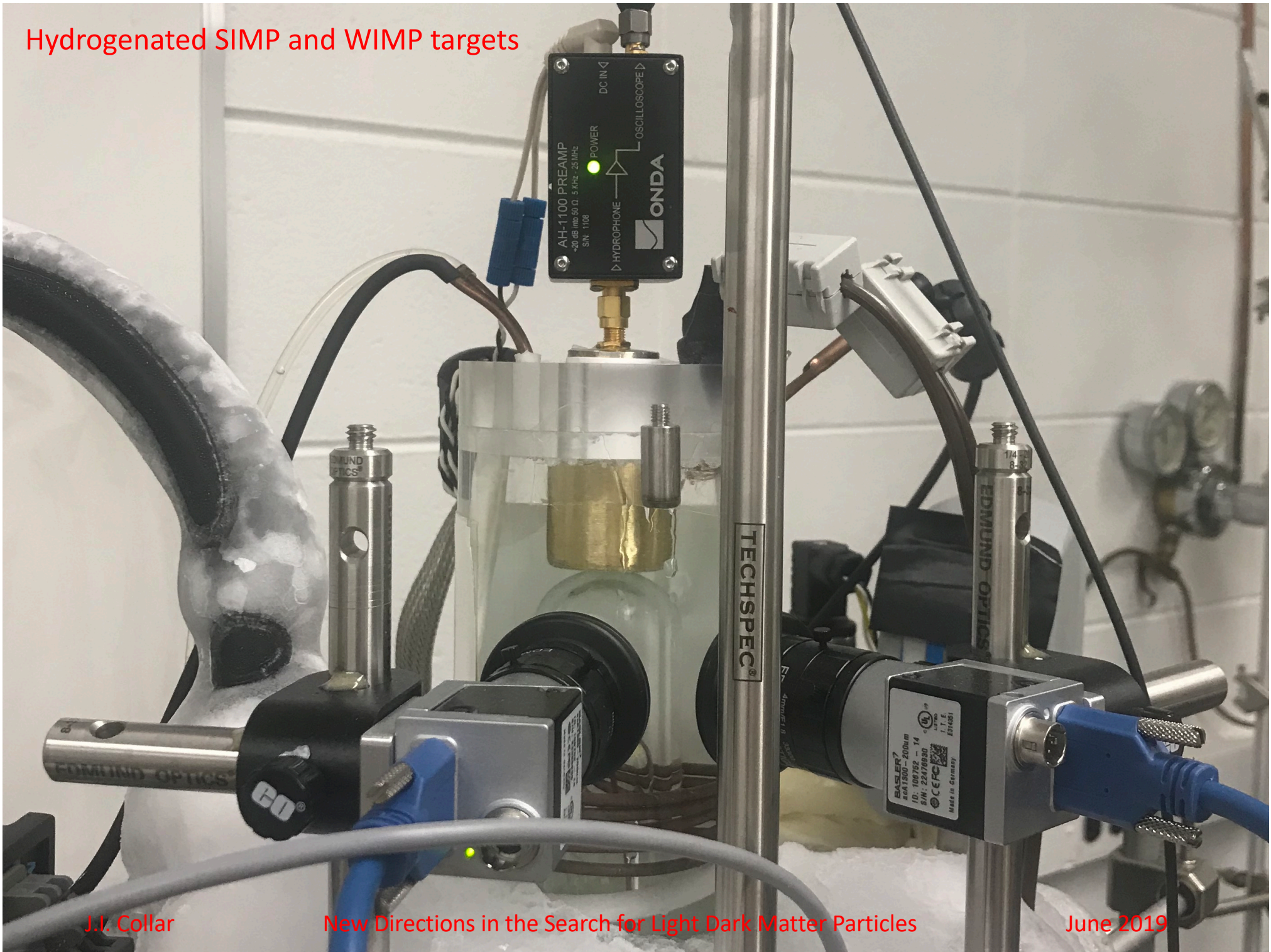
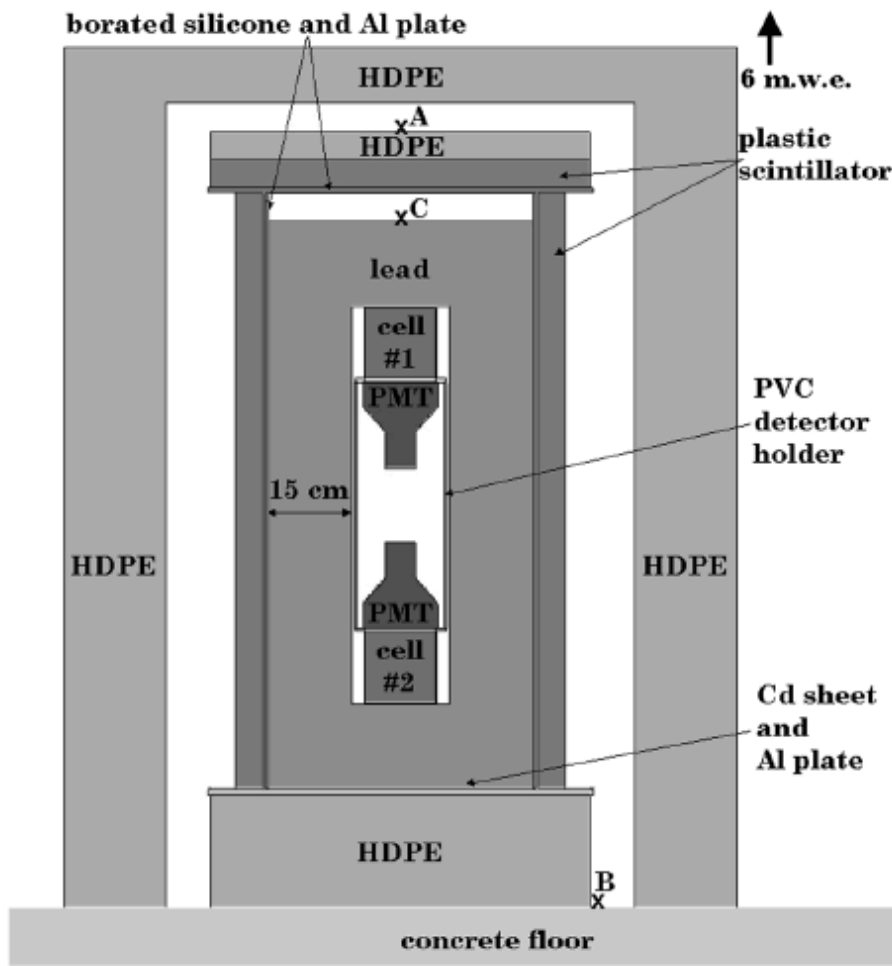


Hydrogenated SIMP and WIMP targets

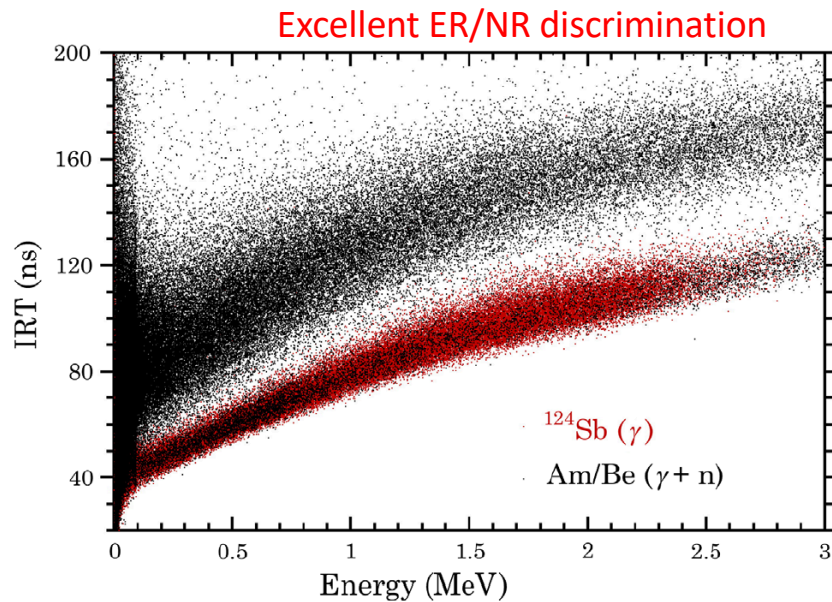
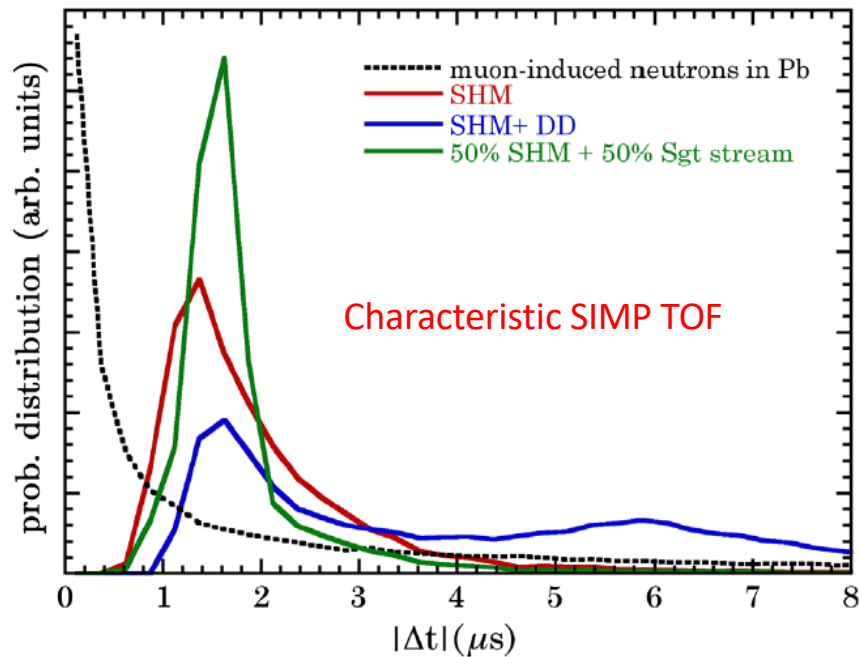


Hydrogenated Fun & Games in our 2nd basement lab (6 m.w.e.)

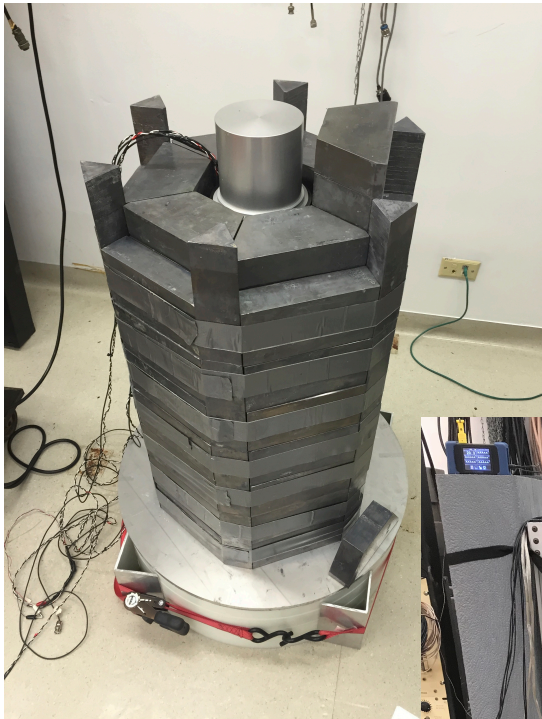


Classic cosmic ray “telescope”

Ideal shallow site for SIMP and SIMPzilla search

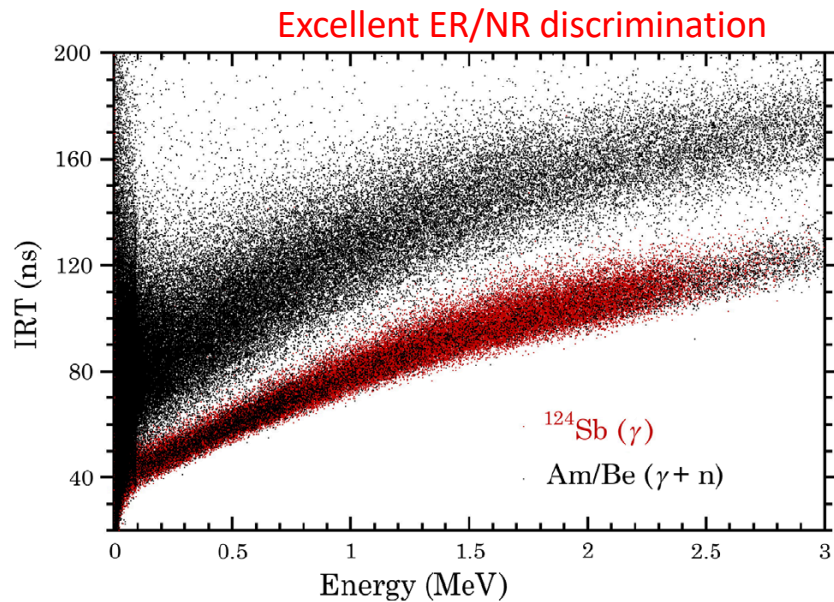
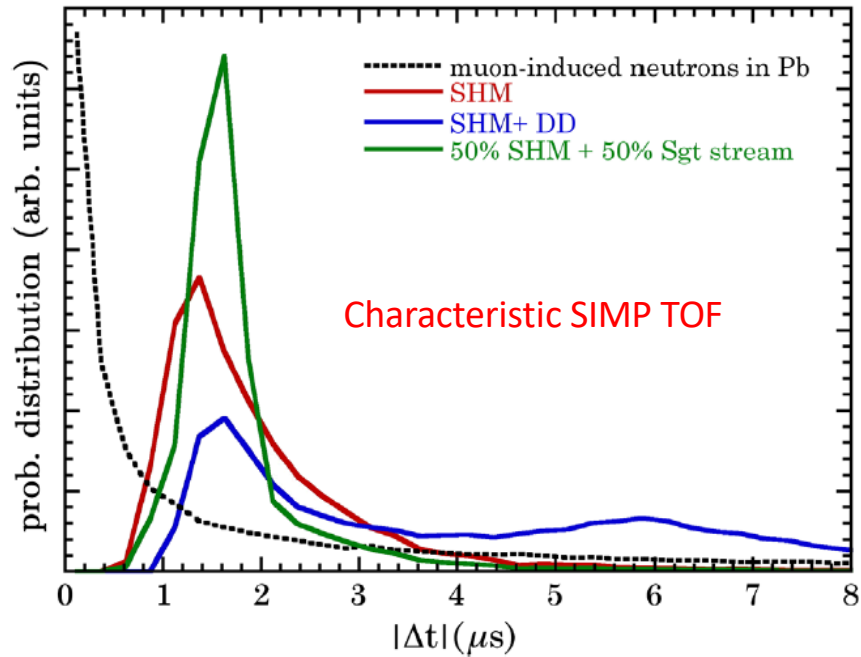


Hydrogenated Fun & Games in our 2nd basement lab (6 m.w.e.)

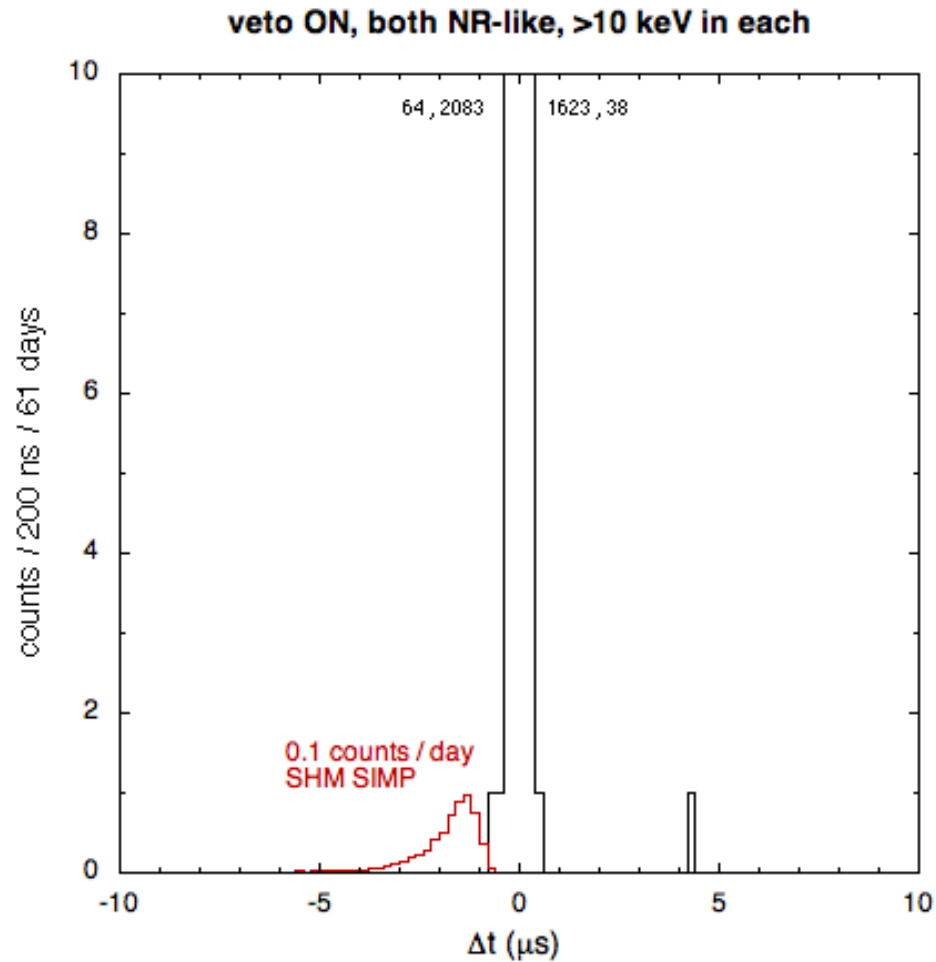


Classic cosmic ray “telescope”

Ideal shallow site for SIMP and SIMPzilla search

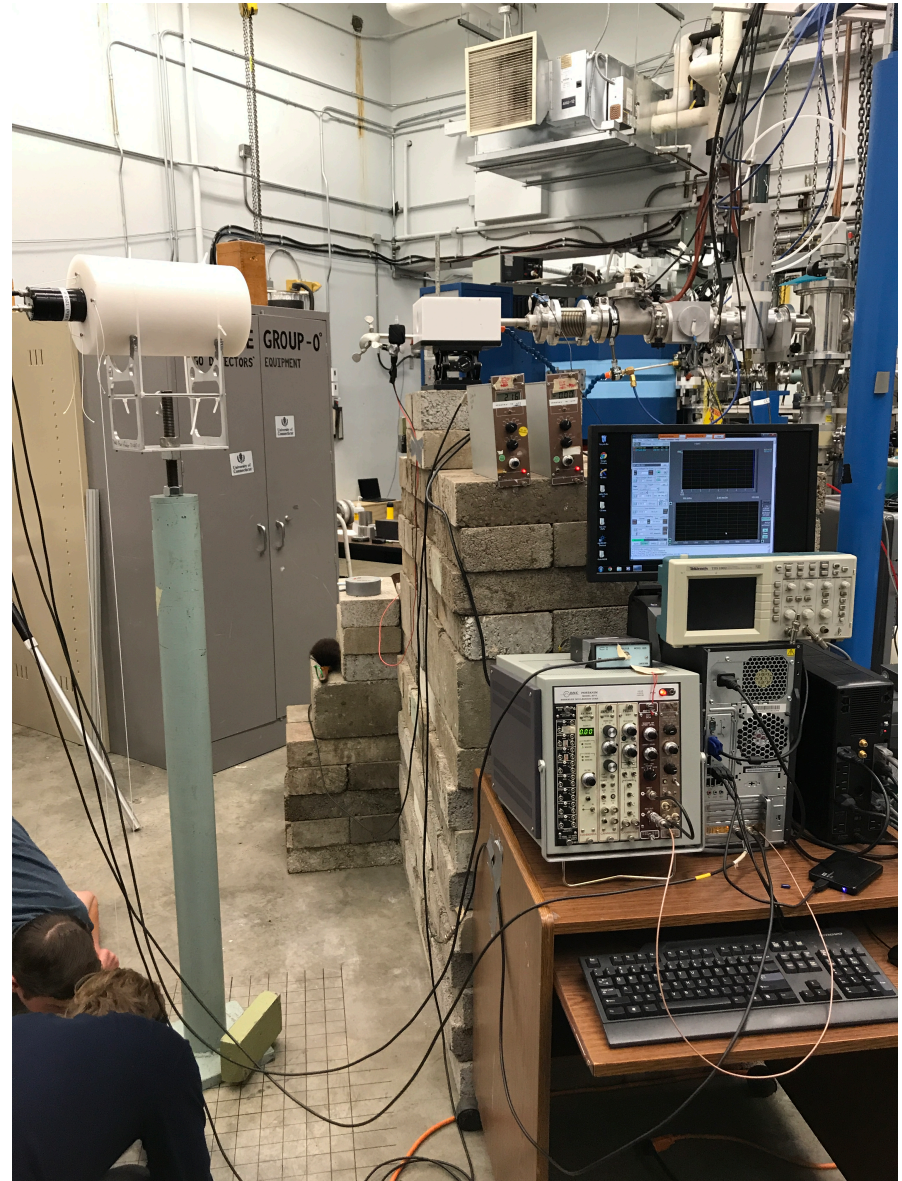
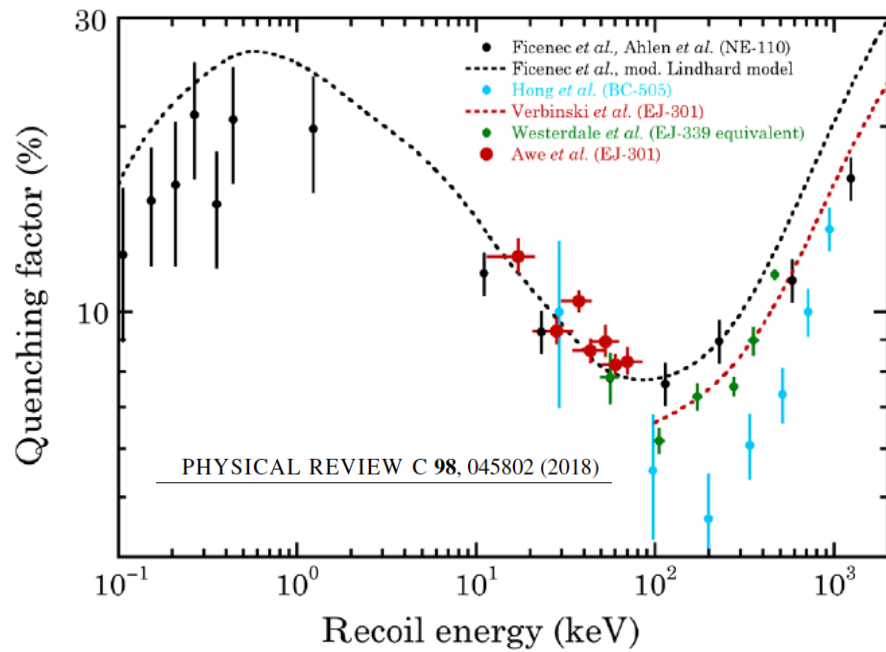
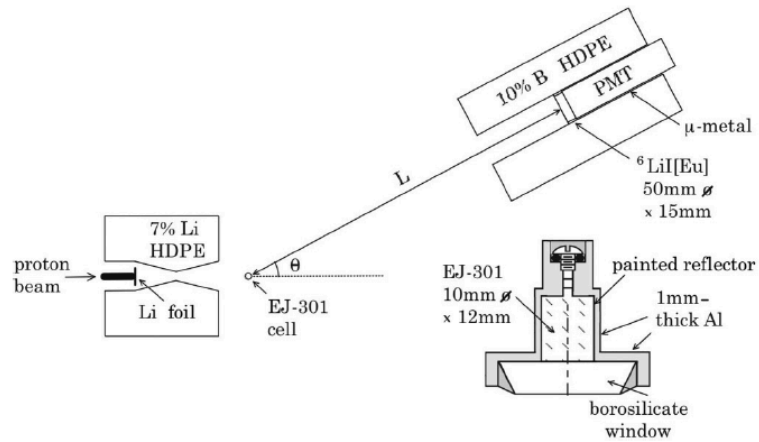


Work in progress (with J. Beacom and C. Cappiello)

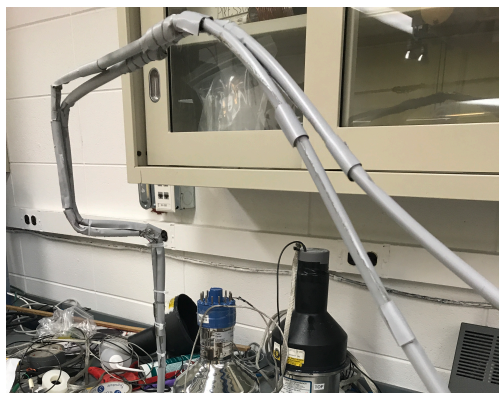


Probes new territory in SIMPzilla parameter space ($\sim 10^8$ - 10^{13} GeV)

Surprising (and favorable) behavior of low-energy p-recoil quenching factor in organic scintillators



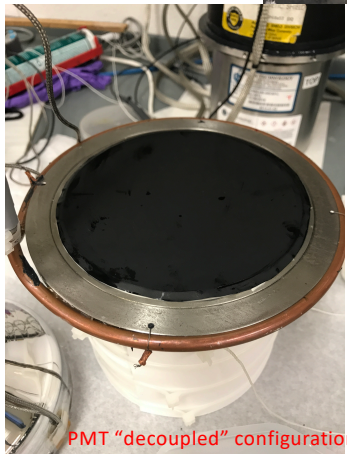
Hydrogenated Fun & Games in our 2nd basement lab (continued)



Low-background
EJ-301 LS cells



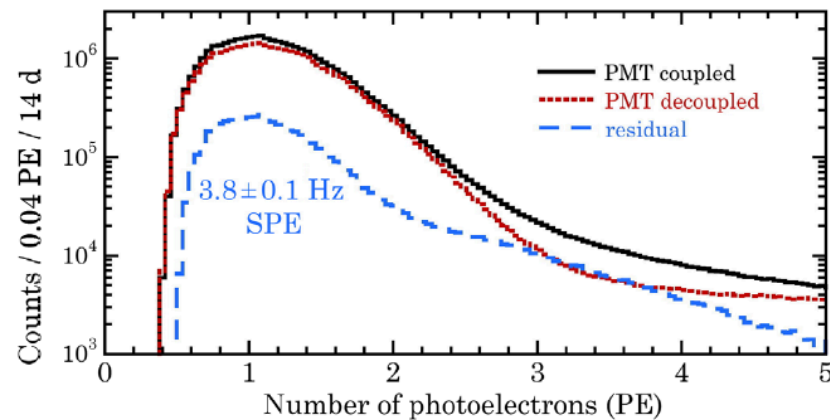
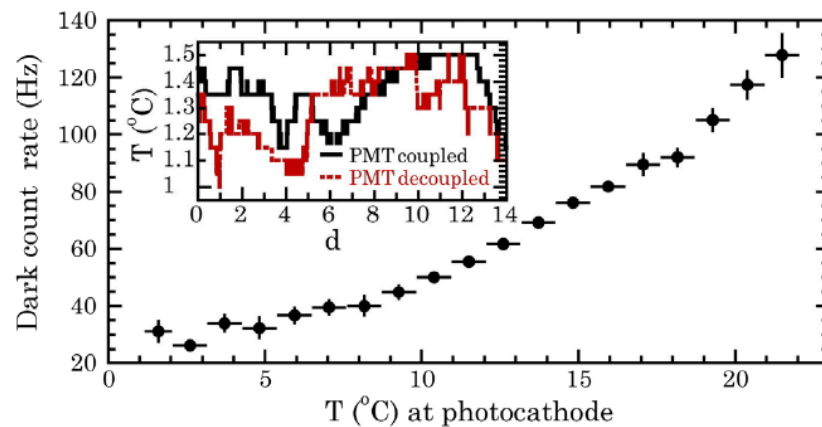
Quite the contraction...



PMT "decoupled" configuration



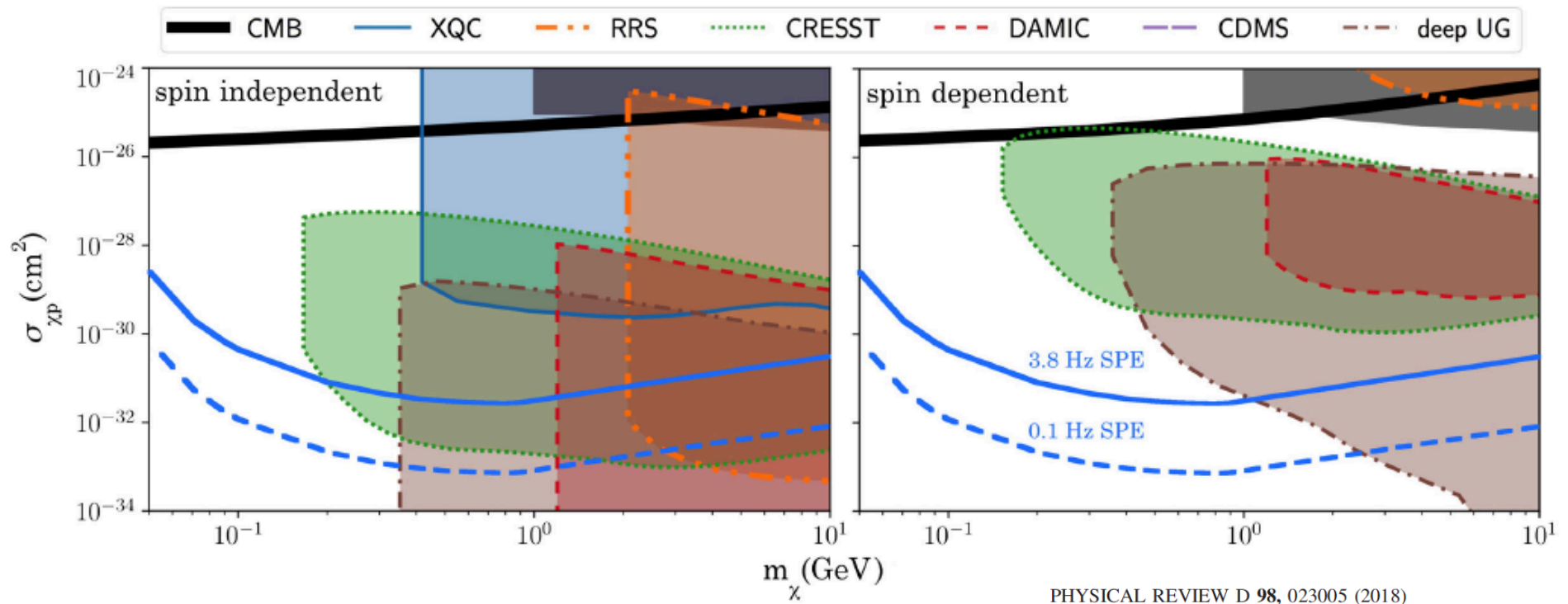
Single detector configuration (PMT cooled to 0C)



Differential measurement allowed by minimal dependence of bialkali PMT dark rate on T around 0C.

T-control of 0(0.1)C is the limiting factor.

Hydrogenated Fun & Games in our 2nd basement lab (continued)



Search for a nonrelativistic component in the spectrum of cosmic rays at Earth

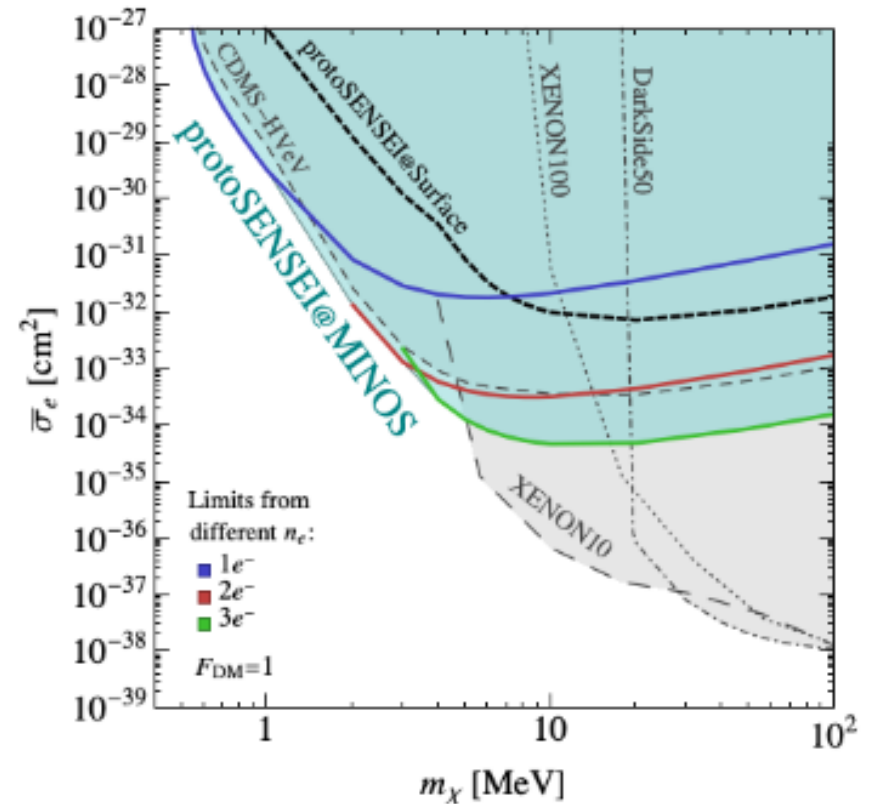
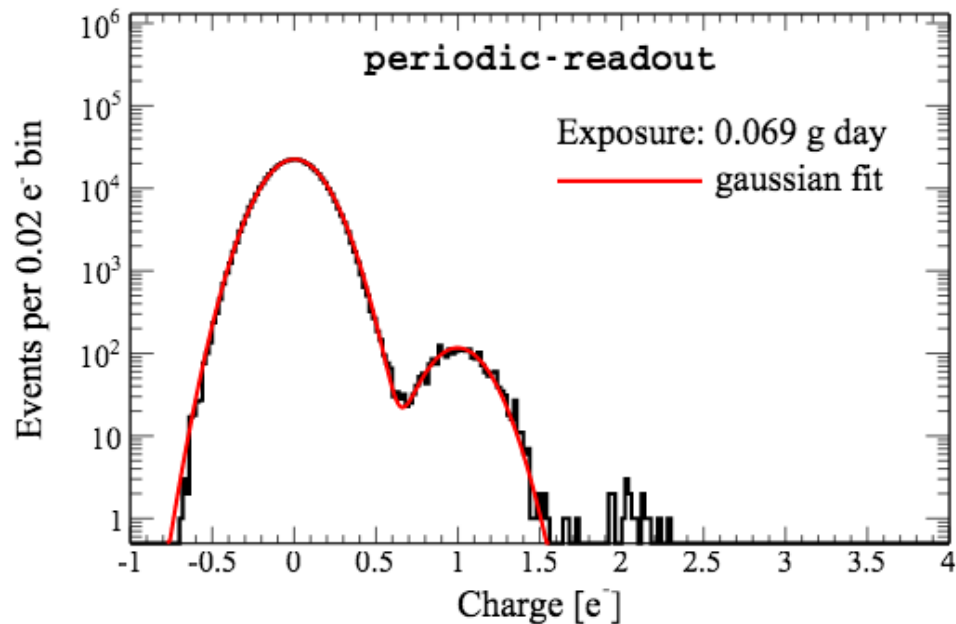
J. I. Collar*

*Enrico Fermi Institute, Department of Physics, and Kavli Institute for Cosmological Physics,
University of Chicago, Chicago, Illinois 60637, USA*

Work in progress (with Y. Kahn, B. Lillard and C. Blanco)

arXiv:1901.10478v1
SENSEI: Direct-Detection Constraints on sub-GeV Dark Matter from a Shallow Underground Run Using a Prototype Skipper-CCD

The SENSEI Collaboration: Orr Abramoff,¹ Liron Barak,¹ Itay M. Bloch,¹ Luke Chaplinsky,^{2,3} Michael Crisler,⁴ Dawa,^{2,3} Alex Drlica-Wagner,⁴ Rouven Essig,² Juan Estrada,⁴ Erez Etzion,¹ Guillermo Fernandez,⁴ Daniel Gift,^{2,3} Joseph Taenzer,¹ Javier Tiffenberg,⁴ Miguel Sofo Haro,^{4,5} Tomer Volansky,^{1,6} and Tien-Tien Yu⁷

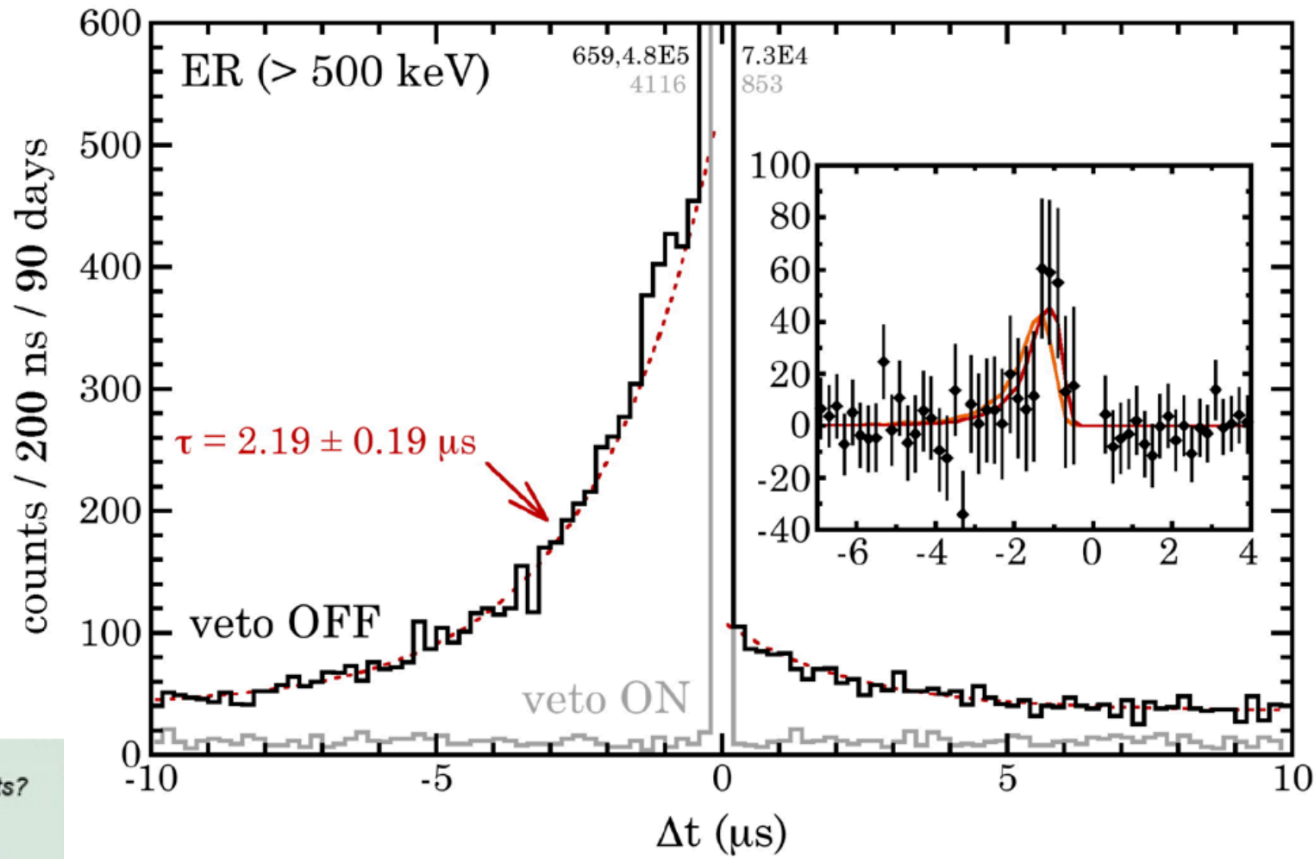


arXiv:1607.01009v1

Direct Detection of sub-GeV Dark Matter with Scintillating Targets

Stephen Derenzo,^{1,*} Rouven Essig,^{2,†} Andrea Massari,^{2,‡} Adrián Soto,^{3,4,§} and Tien-Tien Yu^{2,¶}

What is life without anomalies?
(back to two-detector “telescope” mode)



Following DAQ upgrade to
4-channel, 16-bit:
feature remains the same,
but is **NOT** a
SIMP
(no delay between top muon veto panel and top detector)

What, me ask for additional experiments?



Déjà vu all over again

Physics Letters B 434 (1998) 163–168

Exotic muon decays and the KARMEN anomaly

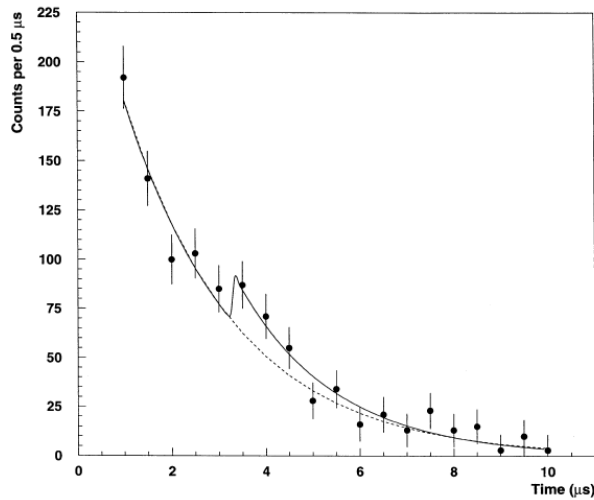
S.N. Gninenko ¹, N.V. Krasnikov ²

Physics Letters B 446 (1999) 363–367

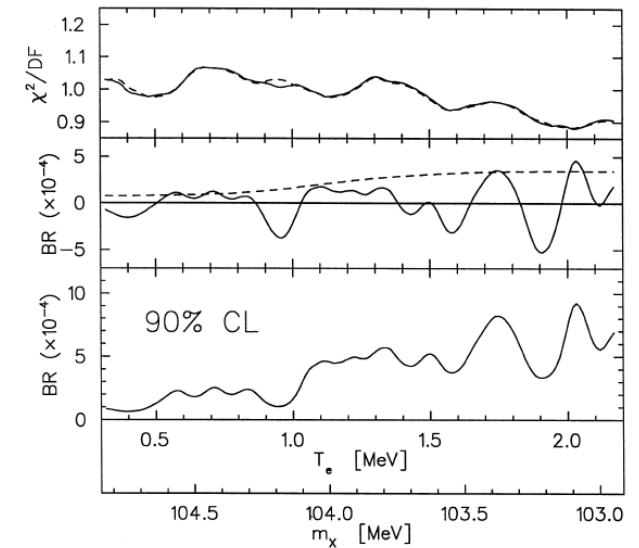
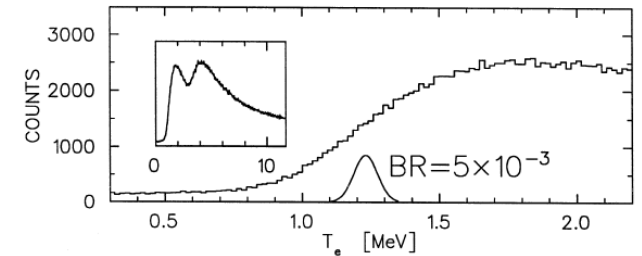
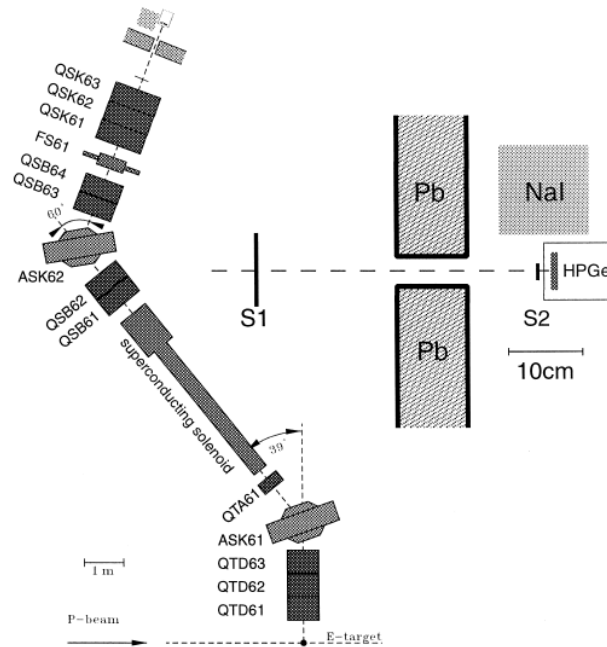
Search for exotic muon decays ¹

R. Bilger ^{a,2}, K. Föhl ^b, H. Clement ^a, M. Cröni ^a, A. Erhardt ^a, R. Meier ^a,
J. Pätzold ^a, G.J. Wagner ^a

$$\mu^+ \rightarrow e^+ X$$

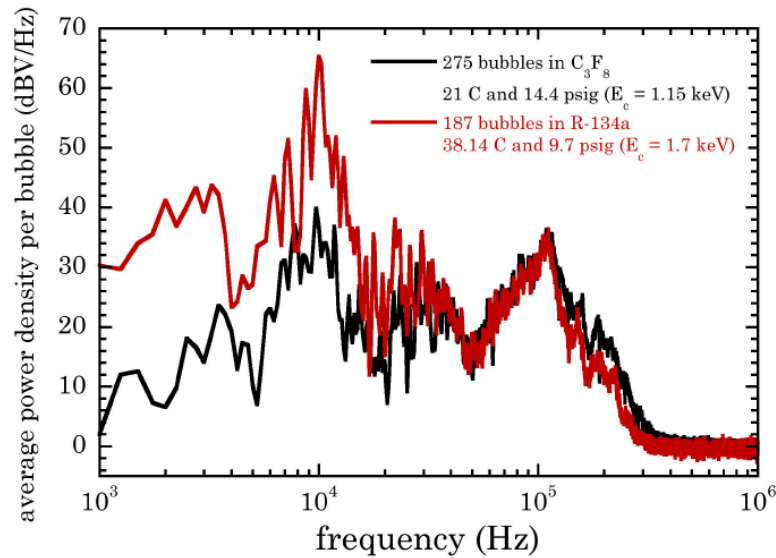


R. Bilger et al. / Physics Letters B 446 (1999) 363–367



Impasse reached (and no existing limits for X mass ROI) -> may have to go to TRIUMF to clear this one out...

Hydrogenated bubble chambers (PICO-LM)



Incipient R-134a experimentation:

- Hints of p-recoil acoustic separation
- Good response to few keV p-recoils
- Expected (superb) ER rejection
- Favorable acoustics

Follow-up to C_3F_8
PICO-40 run using
R-134a ($C_2H_2F_4$)
to expand sensitivity
to sub-GeV WIMPs

Part of the horde of
DOE proposals
submitted last week
(PNNL lead lab)

