# Micromegas
## for an active target

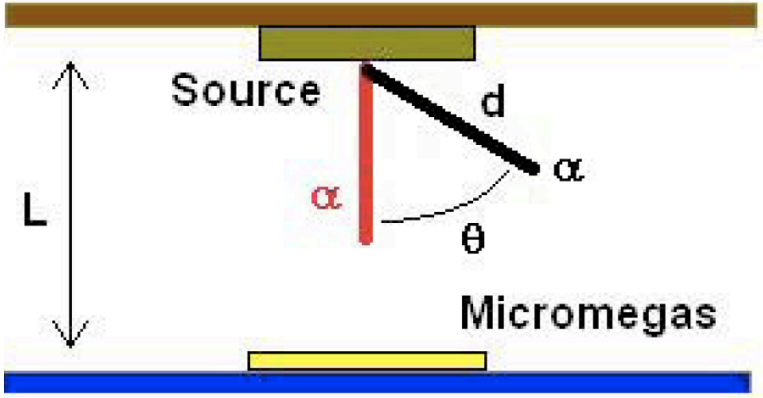
Riccardo Raabe

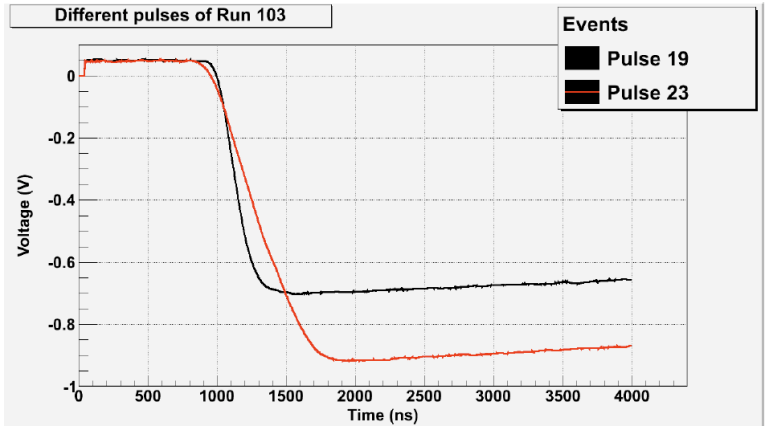
Get Meeting
Caen, 10-12 March 2009

## Energy resolution

(NEXT experiment for double beta decay)

- Microbulk, single detector
- 1.5% to 2% (FWHM)
  Ar + 2% and 5% isobutane
  pressure 2-5 bars
- Landau deconvolution
  $\Rightarrow$ 0.7% FWHM intrinsic
- Independent on drift
  and amplification fields
  and electronics
- Pure Xe 2-4 bar:
  3% to 5% FWHM



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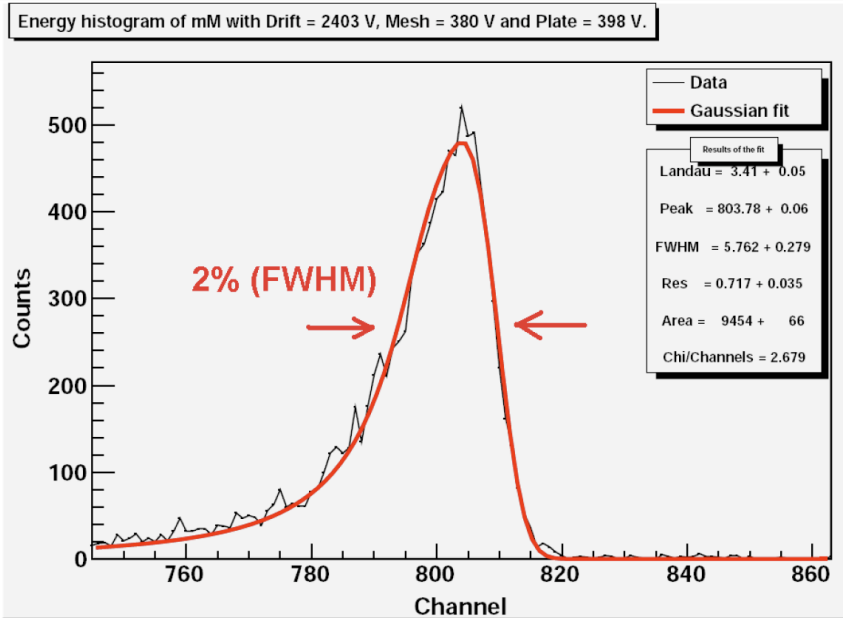
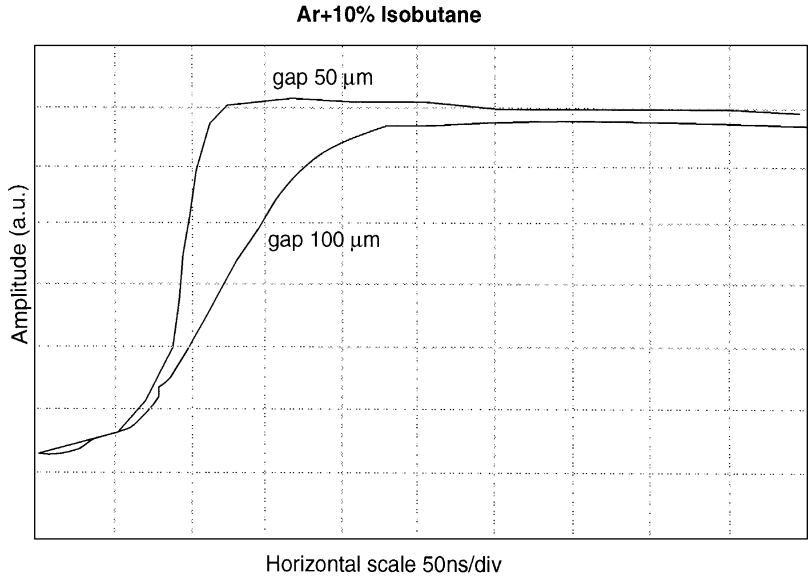


## Timing properties

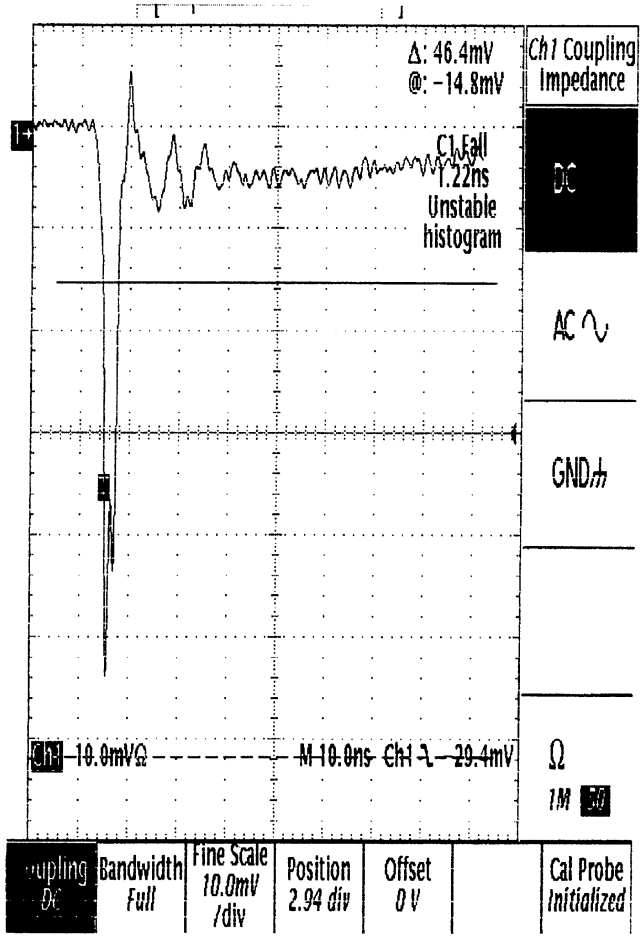
- Ions collection is fast
  $\Rightarrow$ high rate capabilities
- Resolution increases
  with smaller gaps




Y. Giomataris NIM A 419 (1998) 252

## Timing properties

- Ions collection is fast
  $\Rightarrow$ high rate capabilities
- Resolution increases
  with smaller gaps
- Electron signal? Collection
  with a fast current preamp



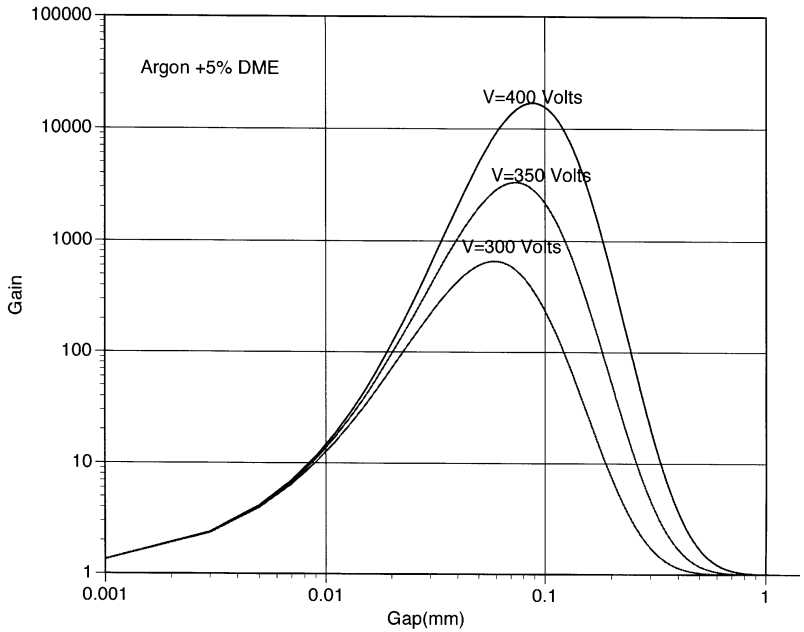

Y. Giomataris NIM A 419 (1998) 252

## Gain uniformity

- The small gap stabilizes the gain

$$M = e^{Apde^{Bpd/V}}$$

max for $pd = V/B$

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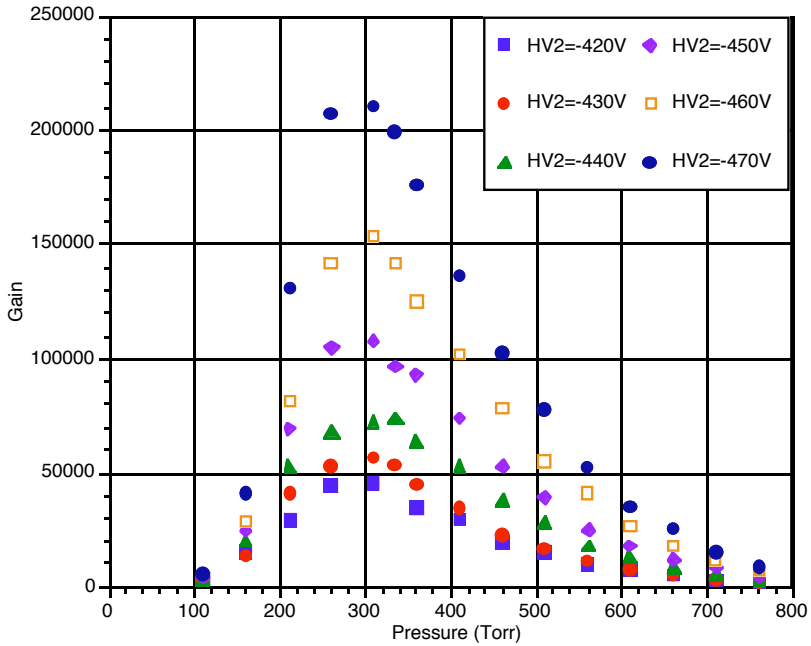


He + 6% $C_4H_{10}$, gap 100 $\mu$m

I. Giomataris, ICFA Instrumentation Bulletin, Vol. 19 (Fall 1999)

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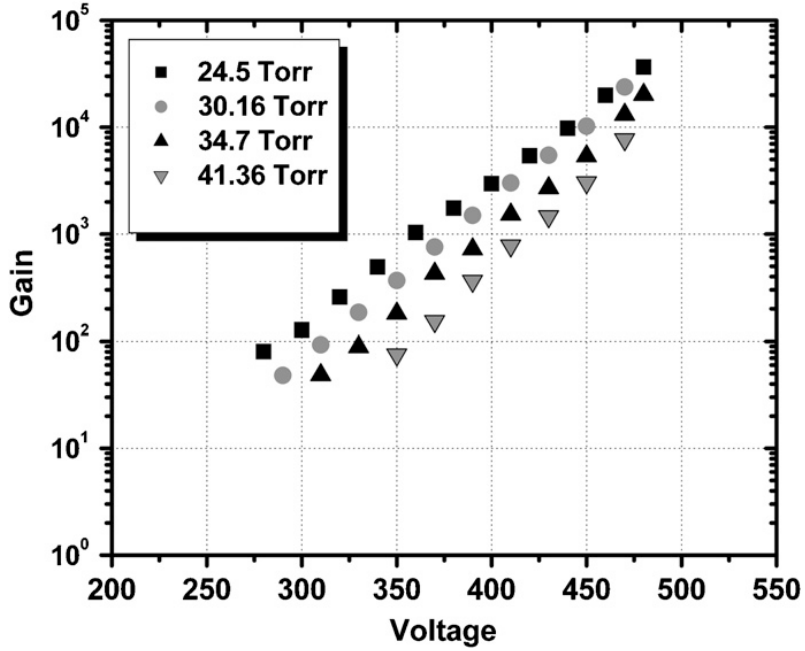
## Low pressures?

- Gas density!
- Timing




pure $C_4H_{10}$, gap 400 $\mu$m

M. Nakhostin, NIM A 598 (2009) 496

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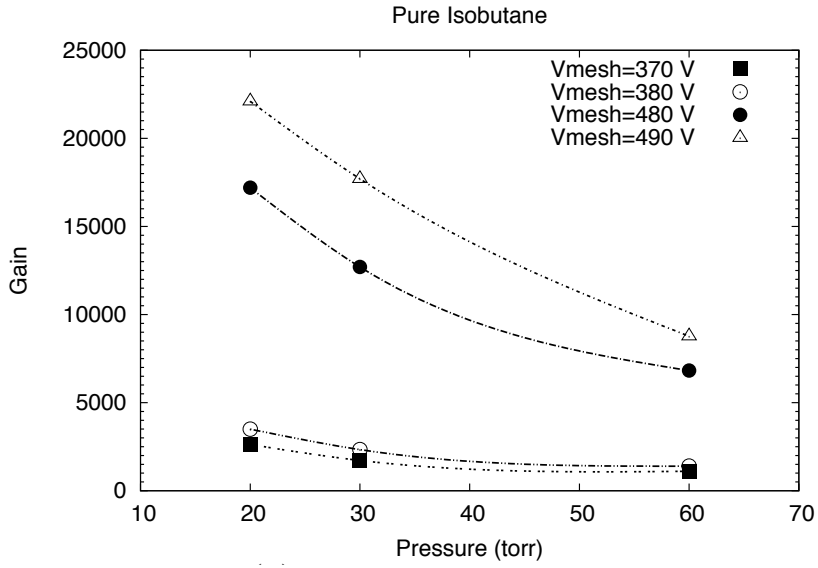


pure $C_4H_{10}$, gap 160 $\mu$m

Test Orsay, 2008

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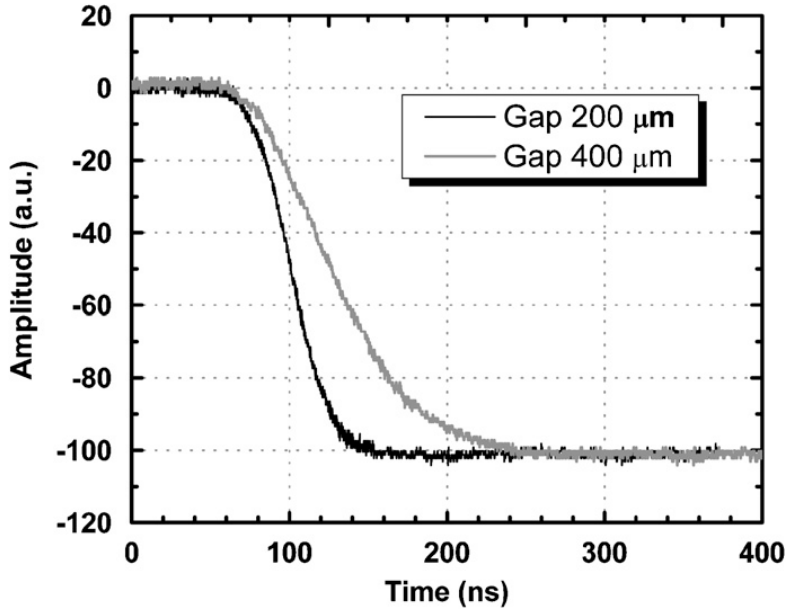


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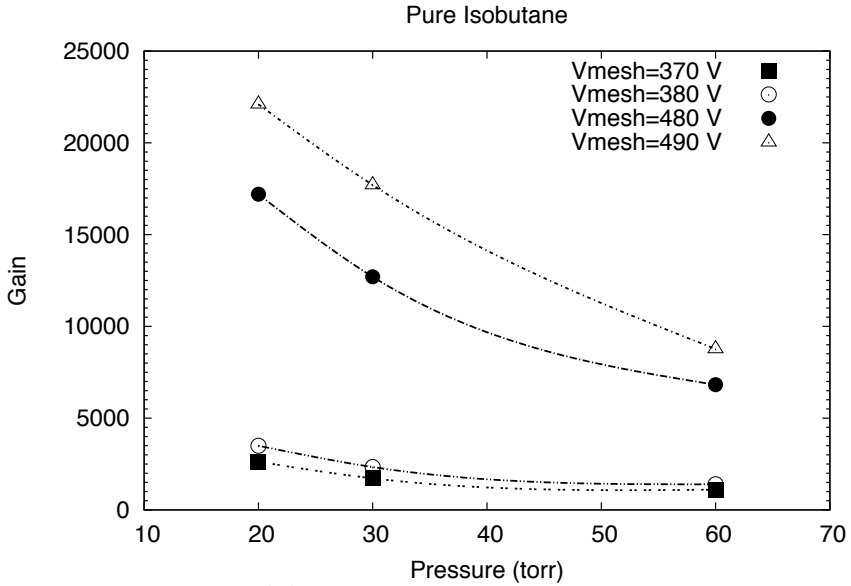
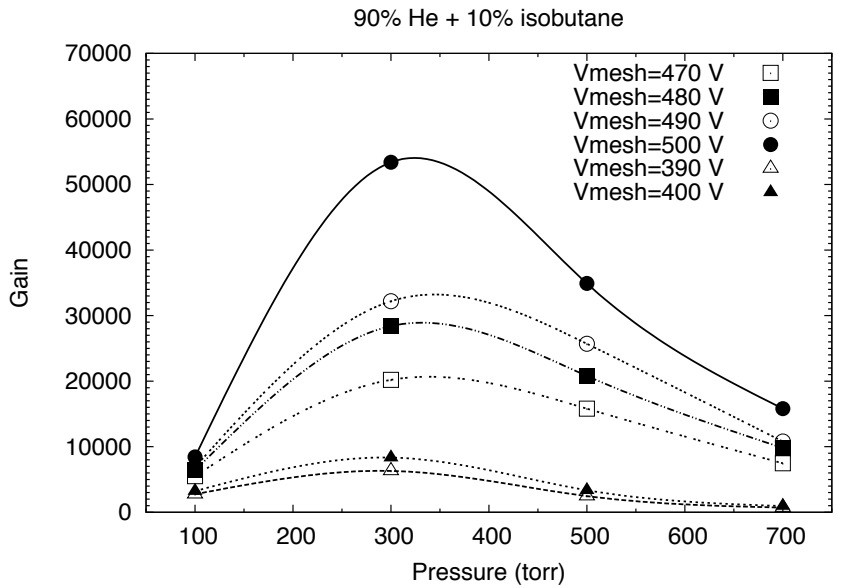
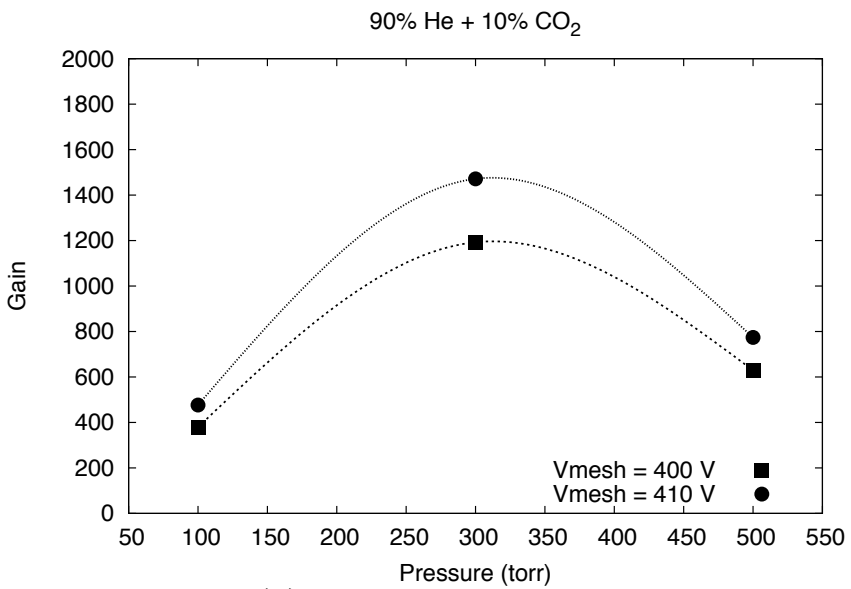
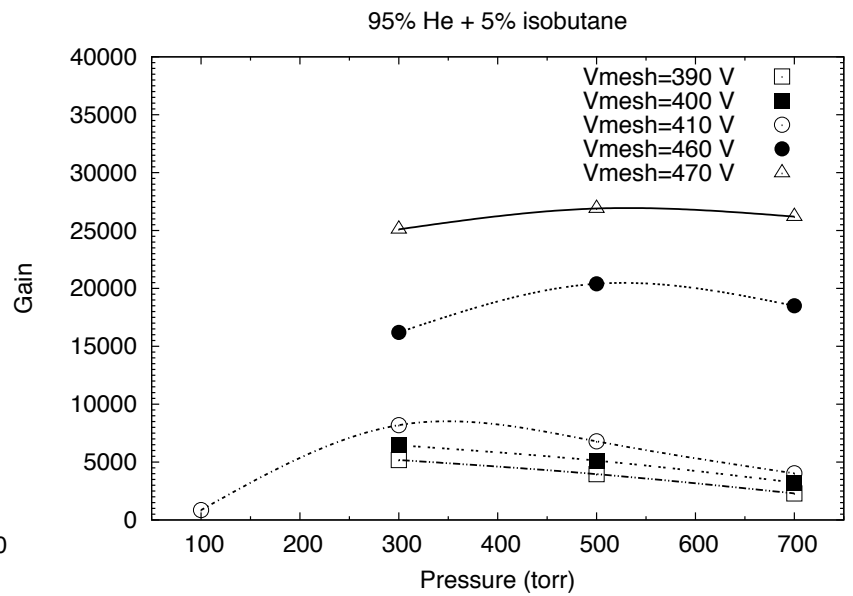
# Tests Orsay - gas mixtures



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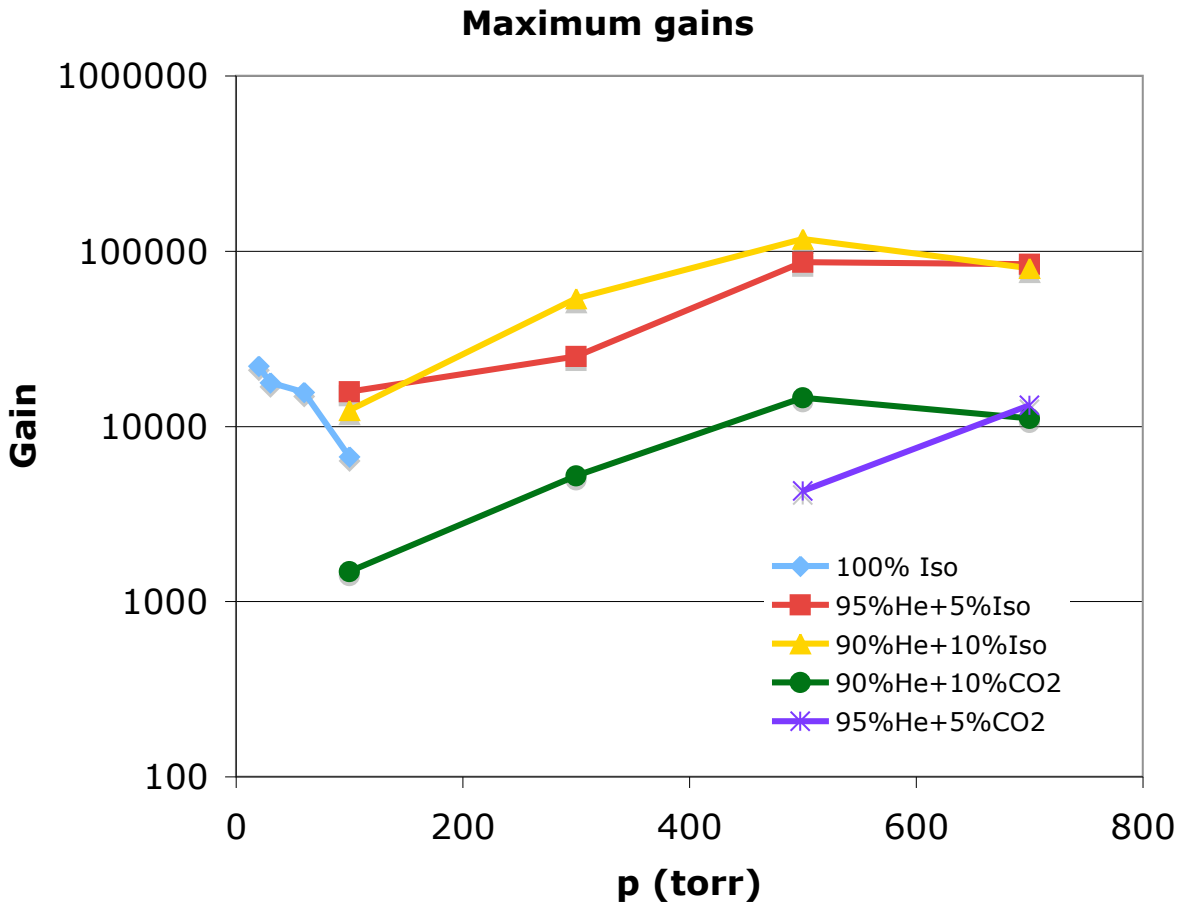
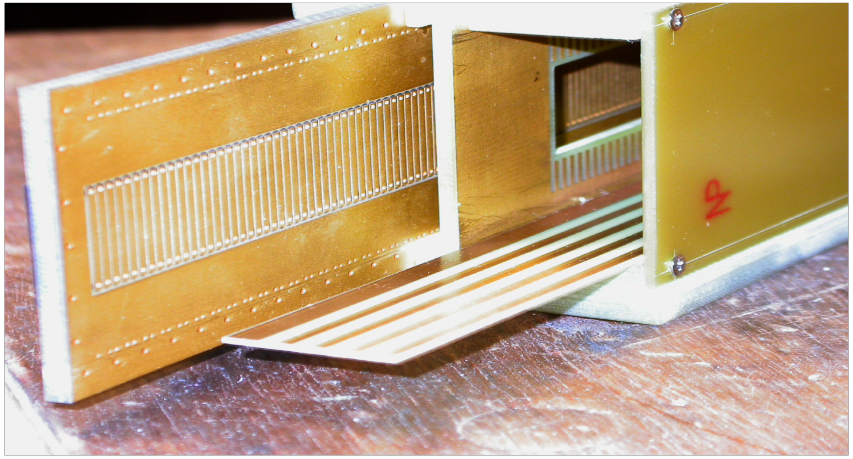


## Tests with Mayaito

- Source $^{226}$Ra, $E_\alpha = 7.687$ MeV
- Position resolution
- Energy resolution
- Gas mixtures
- GEM + Micromegas?



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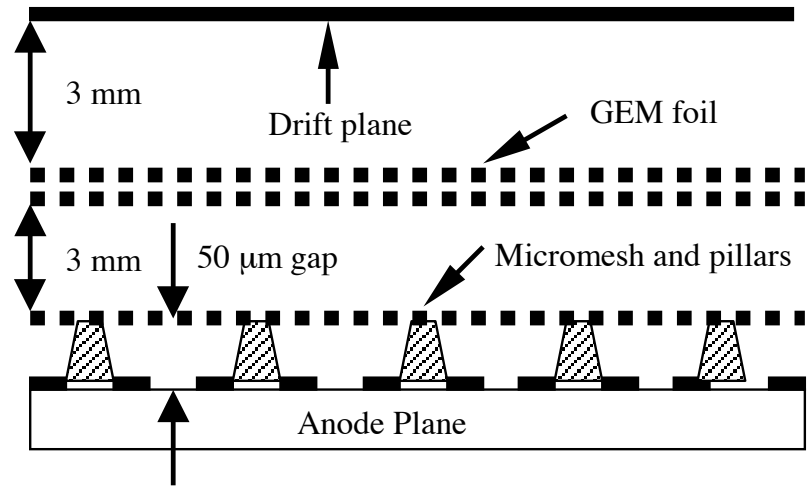


S. Kane, J. May, J.Miyamoto, I.Shipsey and I. Giomataris

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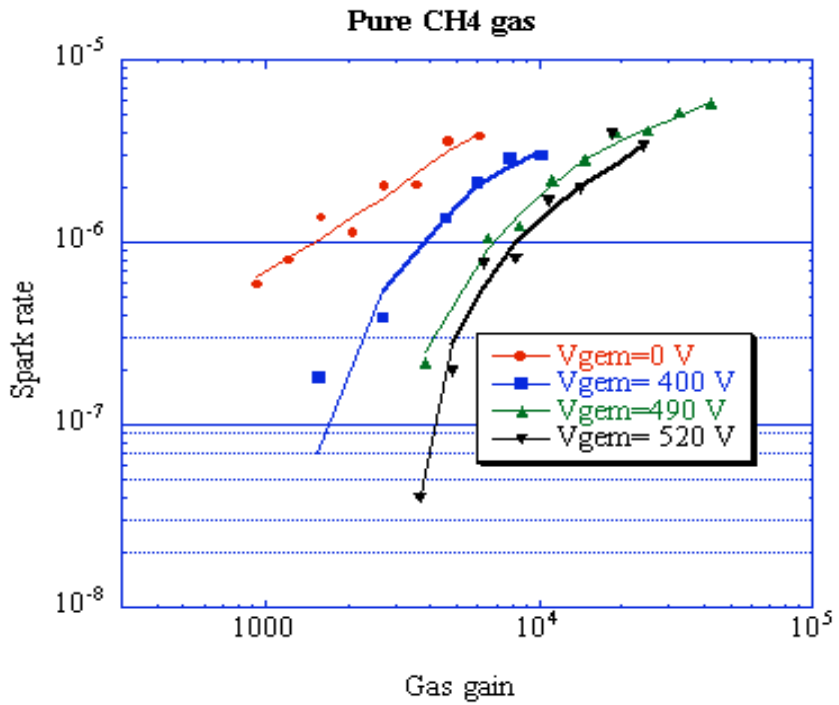


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