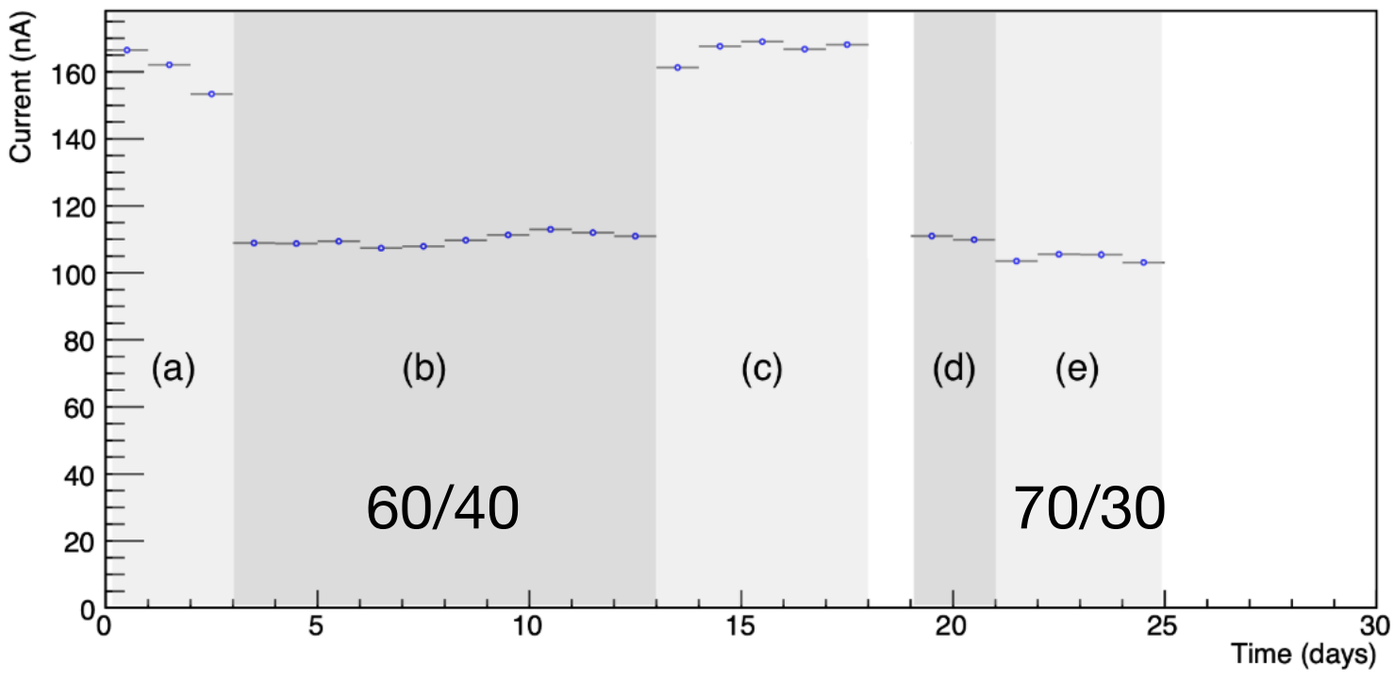
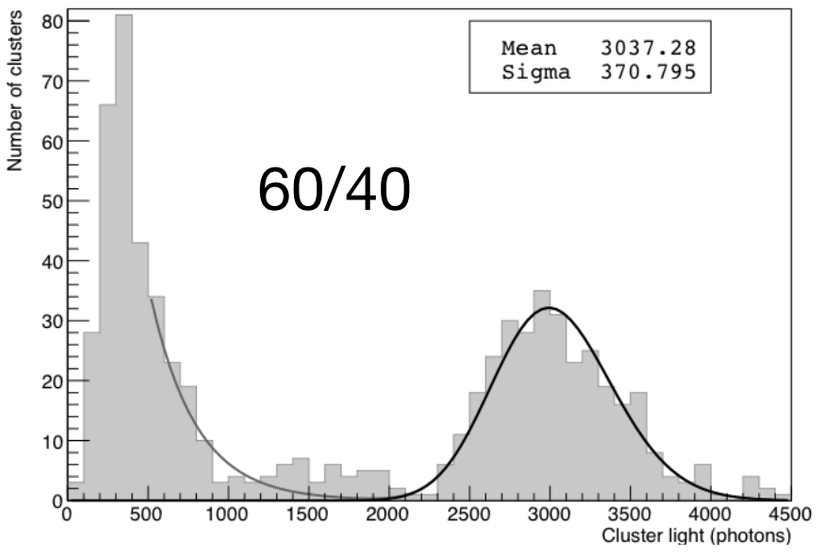
News

Paper on 70/30 vs 60/40

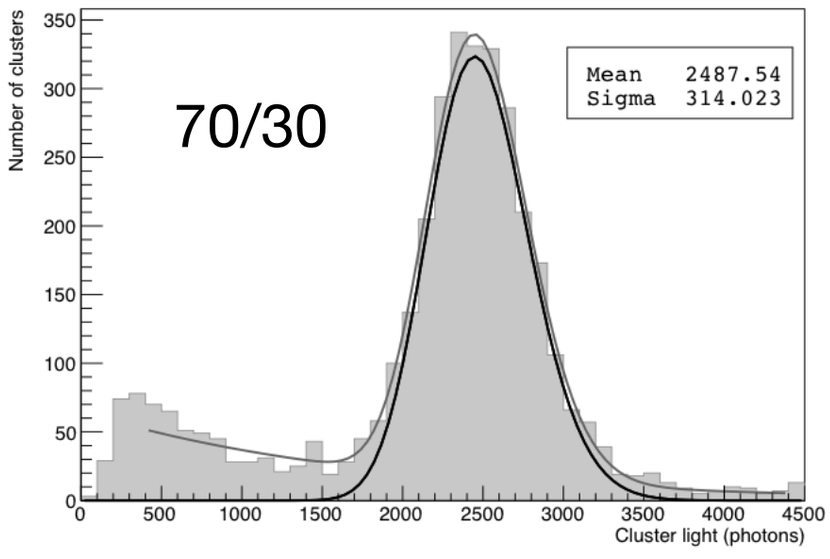
The idea is to compare performance of the two mixtures in the same gain configuration (b) and (e)

Period	Gas Proportion (He/CF_4)	Pb Shielding	^{55}Fe Source	Collimator	Avg. Current (nA)
(a)	60/40	No	No	No	164 ± 2
(b)	60/40	Yes	No	No	110 ± 1
(c)	60/40	Yes	Yes	No	168 ± 2
(d)	60/40	Yes	Yes	Yes	110 ± 1
(e)	70/30	Yes	Yes	Yes	104 ± 2





514 ± 63 detected photons per keV



420 ± 53 detected photons per keV

18% lower light yield for 70/30 and similar energy resolution

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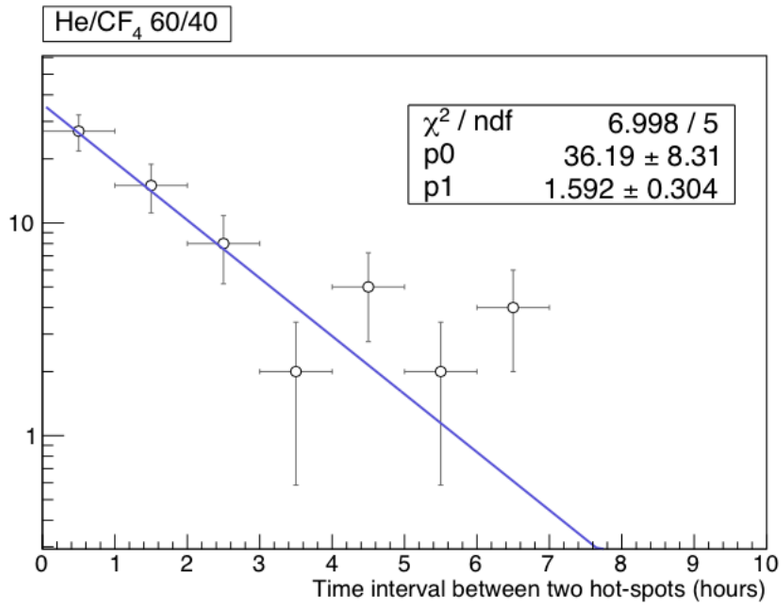
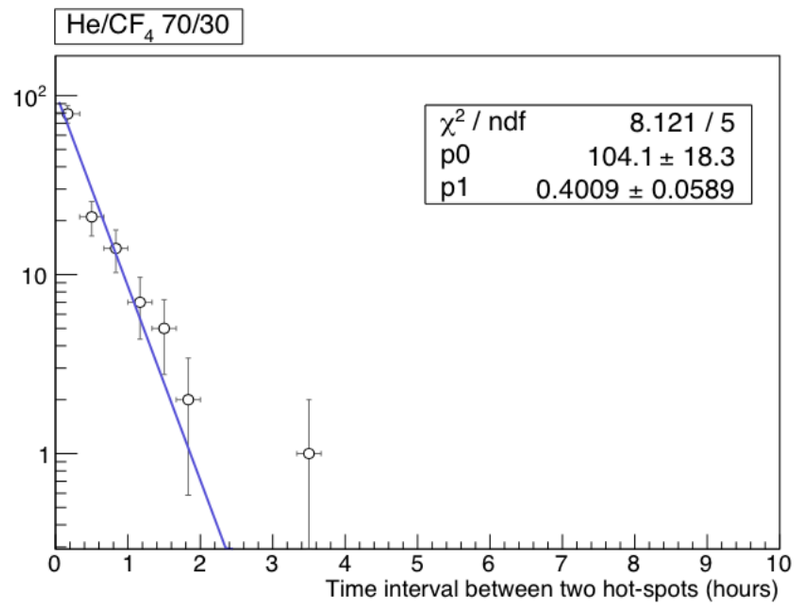
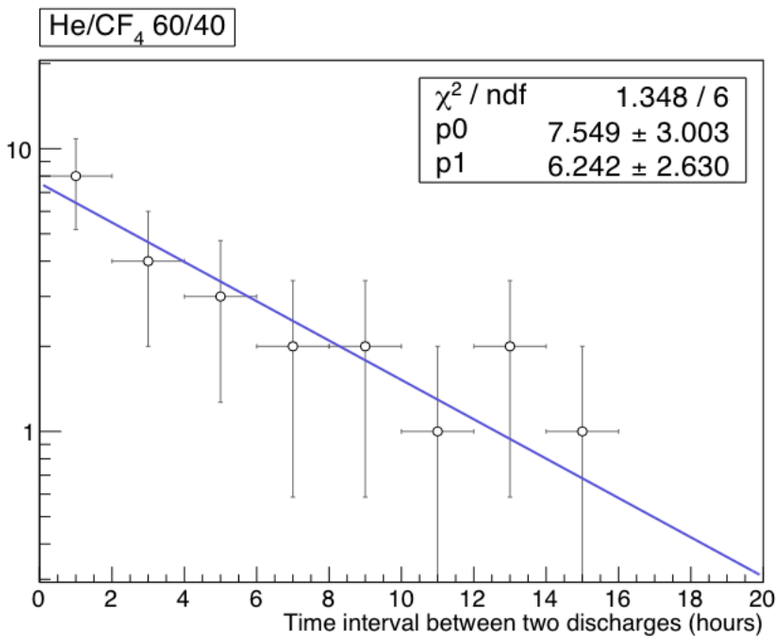
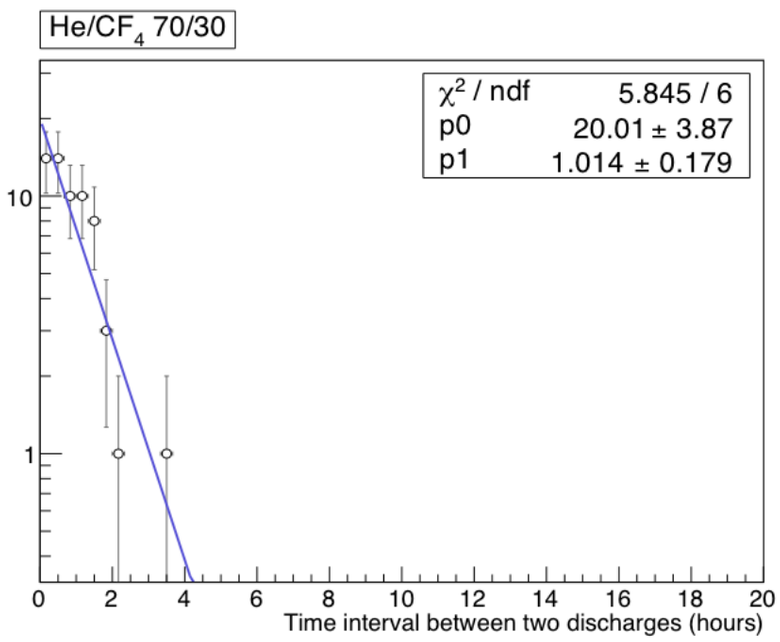




4 times larger hot spot frequency for 70/30

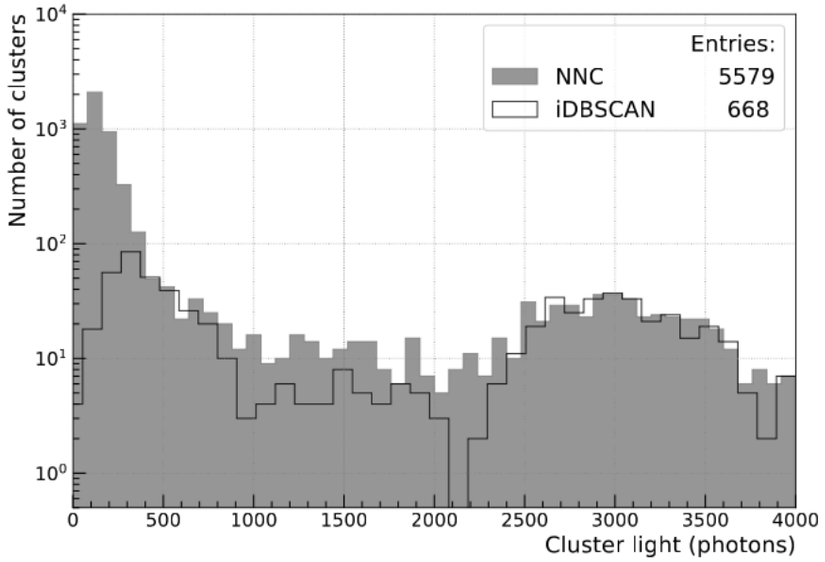




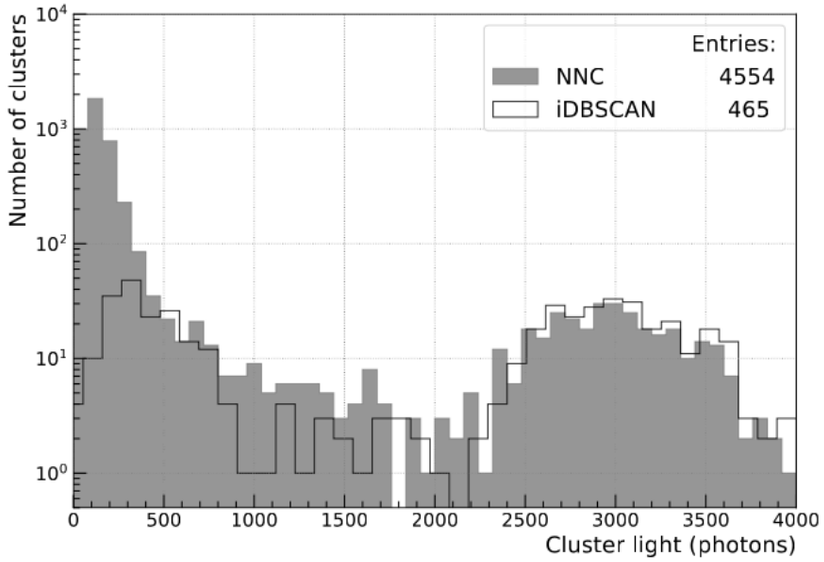
6 times larger discharge frequency for 70/30

Paper on iDBSCAN

The idea is to show that with suitable parameters, iDBSCAN is a very useful tool to reconstruct ^{55}Fe spots



without cut on slimness



with cut on slimness

It is able to provide very high signal (^{55}Fe) detection efficiency together with high Natural Radioactivity rejection

Table 1. Detection Efficiency and False Alarm comparison between NNC and iDBSCAN.

Slimness (width/length)	Efficiency (%)				False Alarm (%)				Background rejection improvement (%)	
	iDBSCAN		NNC		iDBSCAN		NNC			
0.0	97.80	$^{+1.24}_{-2.51}$	96.62	$^{+1.57}_{-2.81}$	13.59	$^{+4.33}_{-3.44}$	38.49	$^{+4.51}_{-4.42}$	40.49	$^{+10.60}_{-9.56}$
0.2	98.53	$^{+0.96}_{-2.31}$	99.32	$^{+0.56}_{-1.79}$	11.80	$^{+4.22}_{-3.30}$	35.53	$^{+4.60}_{-4.29}$	36.80	$^{+10.03}_{-8.75}$
0.4	100	$^{+0.00}_{-1.38}$	100	$^{+0.00}_{-1.27}$	5.54	$^{+3.24}_{-2.15}$	14.45	$^{+4.16}_{-3.36}$	10.42	$^{+6.19}_{-4.68}$
0.6	79.49	$^{+4.43}_{-5.28}$	88.51	$^{+3.26}_{-4.18}$	3.56	$^{+3.27}_{-1.88}$	6.43	$^{+3.52}_{-2.37}$	3.07	$^{+5.14}_{-3.24}$
0.8	33.7	$^{+5.85}_{-5.52}$	42.22	$^{+5.74}_{-5.59}$	4.17	$^{+6.10}_{-2.73}$	3.1	$^{+4.54}_{-2.03}$	-1.10	$^{+3.51}_{-7.85}$

Procurements

Item	Code	Company	Q.ty	Who buys	Cost	Fund	Status
HV for 2-Triple GEM	A1515TG	CAEN	1	Davide	6200	INITIUM	Ordine
Crate for HV-GEM	SY4527LC	CAEN	1	Davide	<5900	INITIUM	Ordine
Camera CMOS	Orca FUSION	Hamamatsu	1	Davide	12000	INITIUM	
Optics	tbd	tbd	2	Francesco R	tbd	CYGNO	
PC for DAQ	tbd	tbd	1	Francesco I	tbd	CYGNO	
PC for Slow Control	M920 32MB	Convenzione	1	Francesco R	734	INITIUM	
HV for Cathode	H500705n	ISEG	1	Francesco R	4240	INITIUM	RDA
Switches for LNGS	tbd	tbd	3	Giovanni M	tbd	INITIUM	
Helium Bottles	tbd	tbd	5	Giovanni M	tbd	CYGNO	
CF4 Bottels	tbd	tbd	5	Giovanni M	tbd	CYGNO	
Water Chiller	KTD Chiller - 4	Applied Therma	1	Giovanni M	3284	CYGNO	
PC di servizio LNF	tbd	tbd	1	Giovanni M	tbd	INITIUM	
VME electronics	-	CAEN	1	Francesco R	tbd	INITIUM	RDA
VME electronics	tbd	CAEN	1	Francesco R	tbd	CYGNO	RDA
T and P sensors	tbd	RS	1	Francesco R	tbd	CYGNO	