

H6 Test beam (29. okt – 12. nov. 2007)

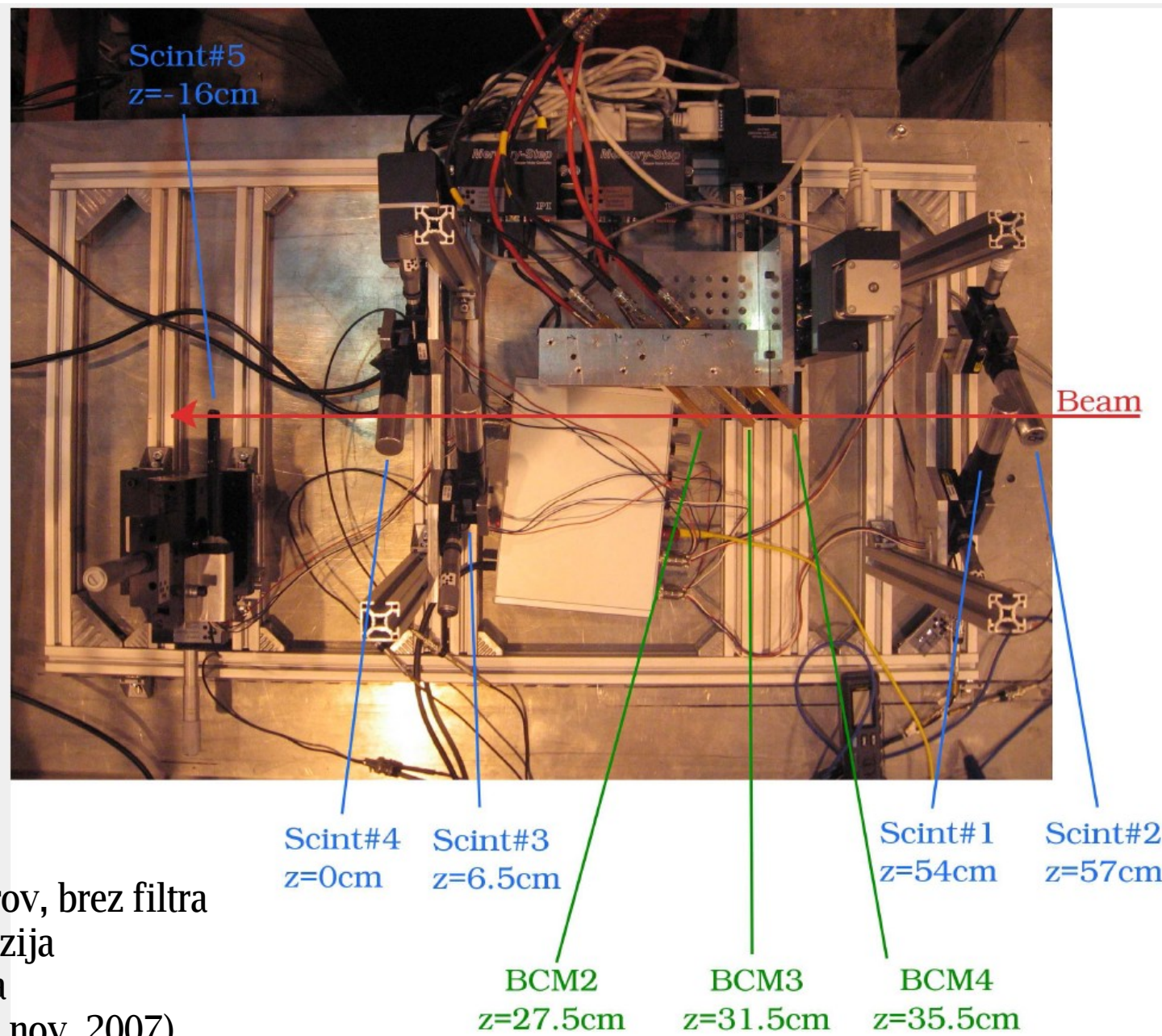
Irena Dolenc, Andrej Gorišek

Setup

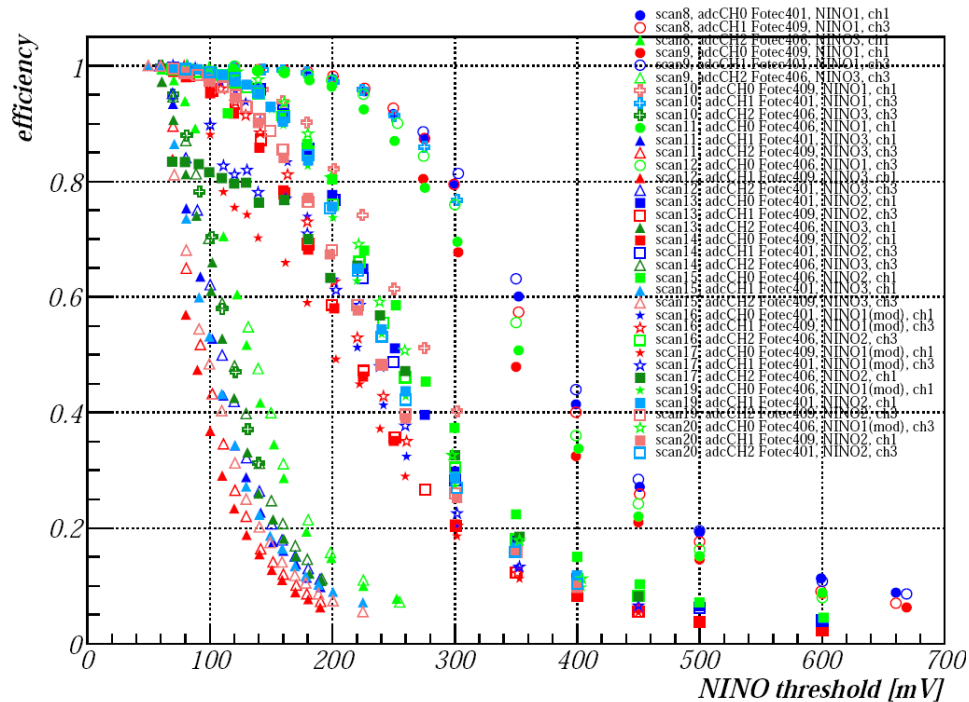
- × **ADC ch0:** F401 (BCM2)
->irradiated with
 $2.3 \cdot 10^{14} \text{p/cm}^2$
- × **ADC ch1:** F409 (BCM3)
- × **ADC ch2:** F406 (BCM4)
- × **ADC ch3:** F413 (trigger,
NIM signal, attenuated by
factor 0.25 ie. 12db)
- × **trigger:** coincidence of
scintillators 1,2,3,4

Oznake:

- × NINO1: brez obeh uporov, brez filtra
- × NINO2: Helmutova verzija
- × NINO3: Erikova verzija
- × NINO1mod: dodan filter (9. nov. 2007)



NINO efficiency & noise rate:



Oznake:

- NINO1
- NINO2
- ▲ NINO3
- ★ NINO1mod

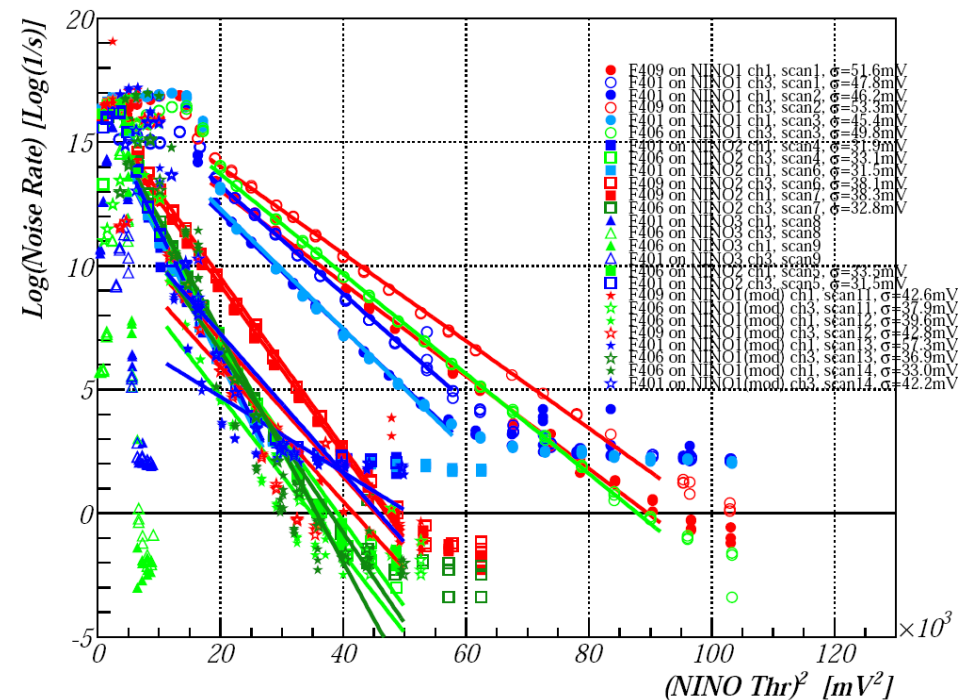
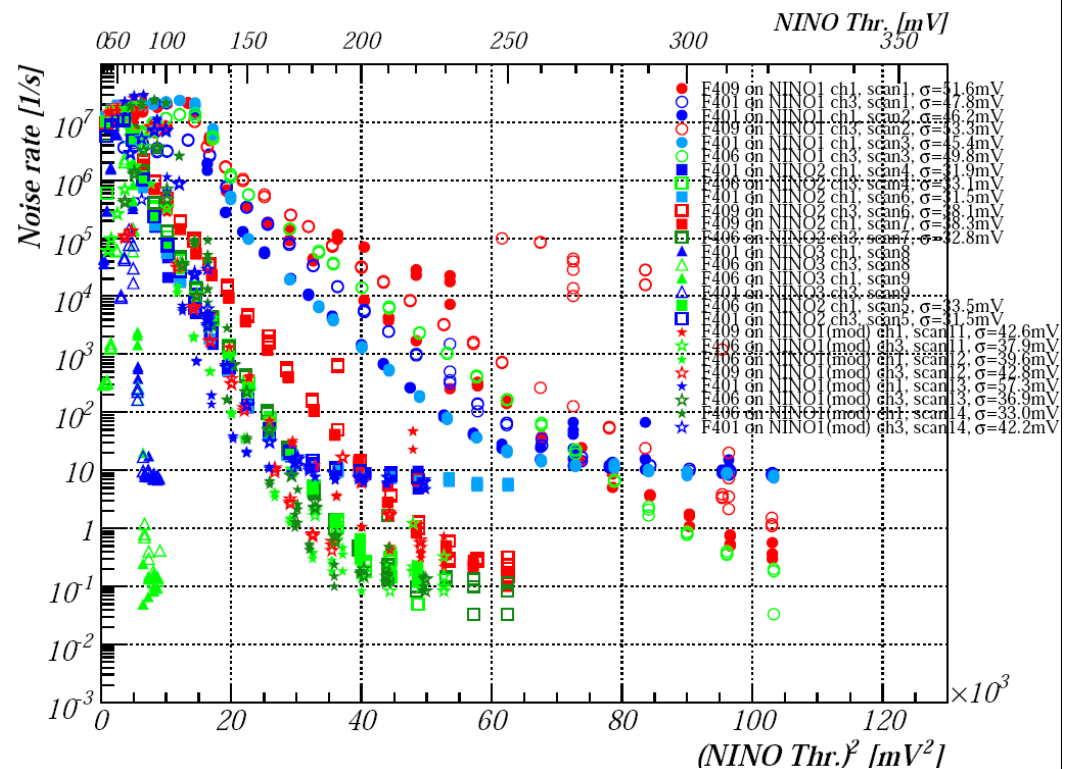
modri markerji: F401

rdeci markerji: F409

zeleni markerji: F406

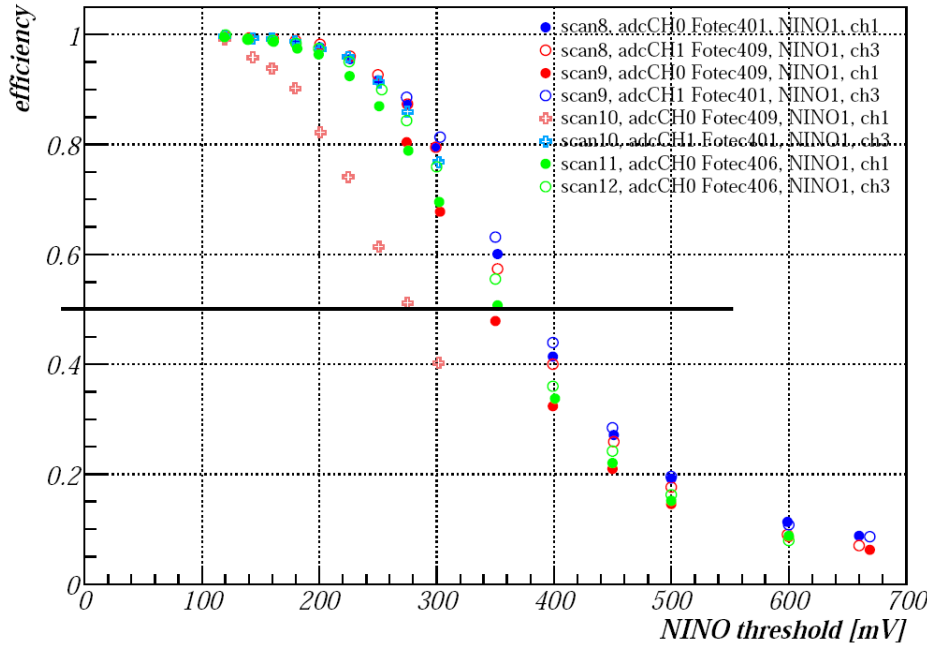
polni markerji: NINO ch1

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prazni markerji: NINO ch3
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NINO1:

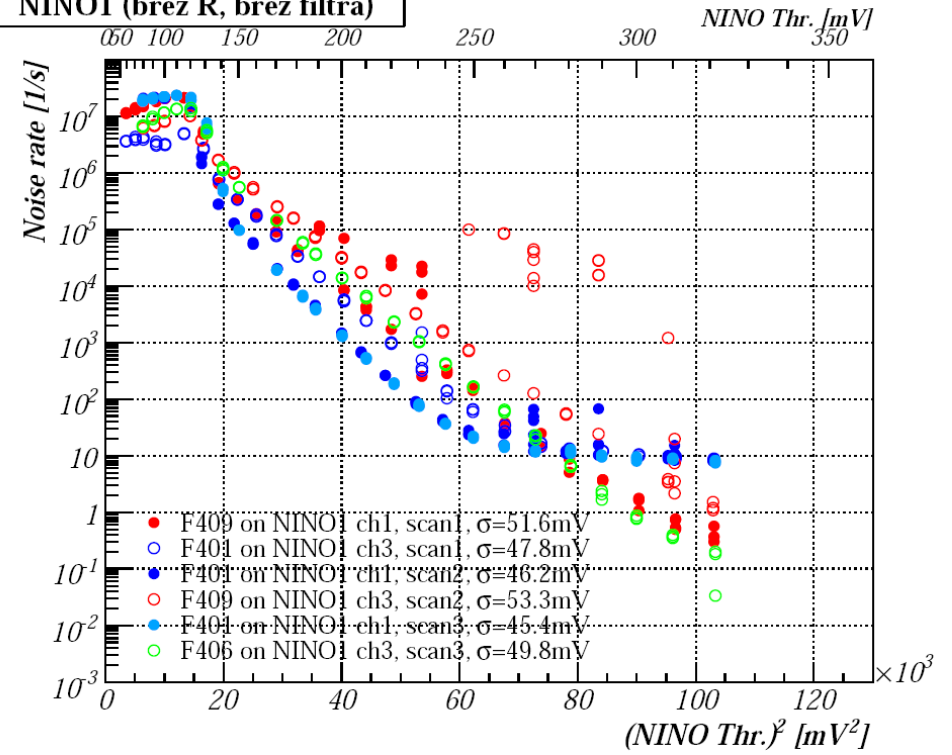
NINO1 (brez R, brez filtra)



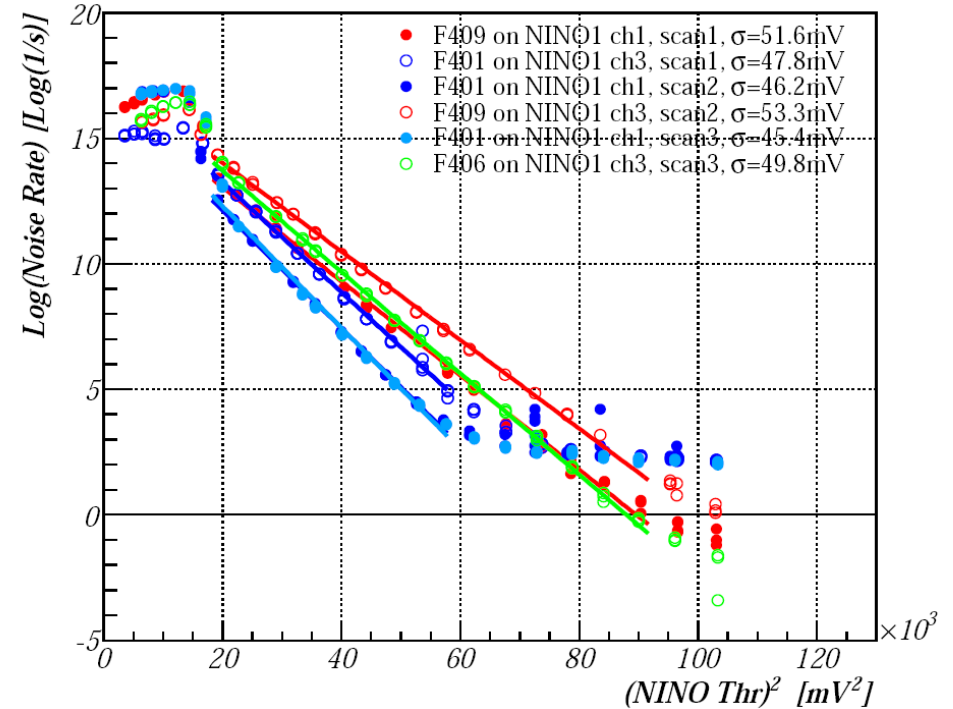
from the fit: $\log(\text{Noise Rate}) = A + \frac{\text{Thr}^2}{2\sigma^2}$

Module	σ [mV]		Thr @ 0.5 eff [mV]	
	ch1	ch3	ch1	ch3
F401	46.2, 45.4	47.8	380	380
F406	/	49.8	350	370
F409	51.6	53.3	340	370

NINO1 (brez R, brez filtra)

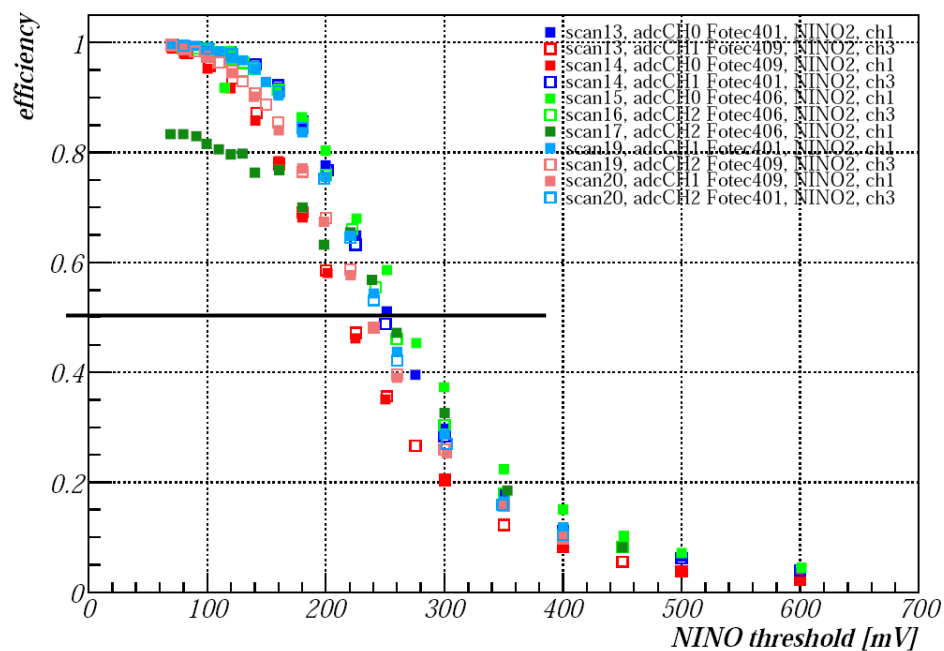


NINO1 (brez R, brez filtra)



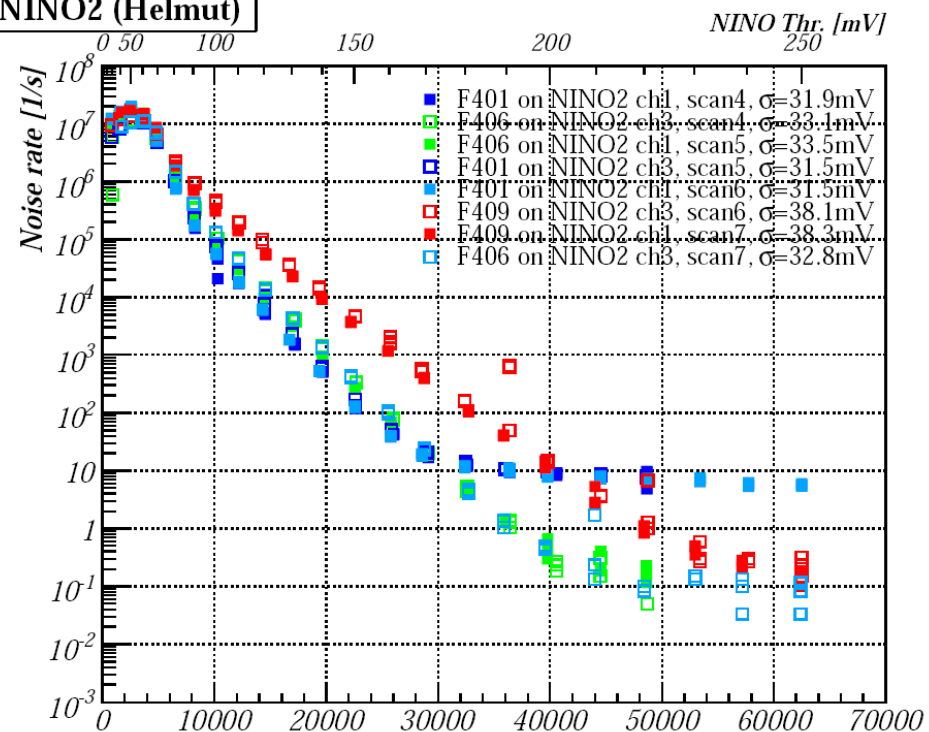
NINO2:

NINO2 (Helmut)

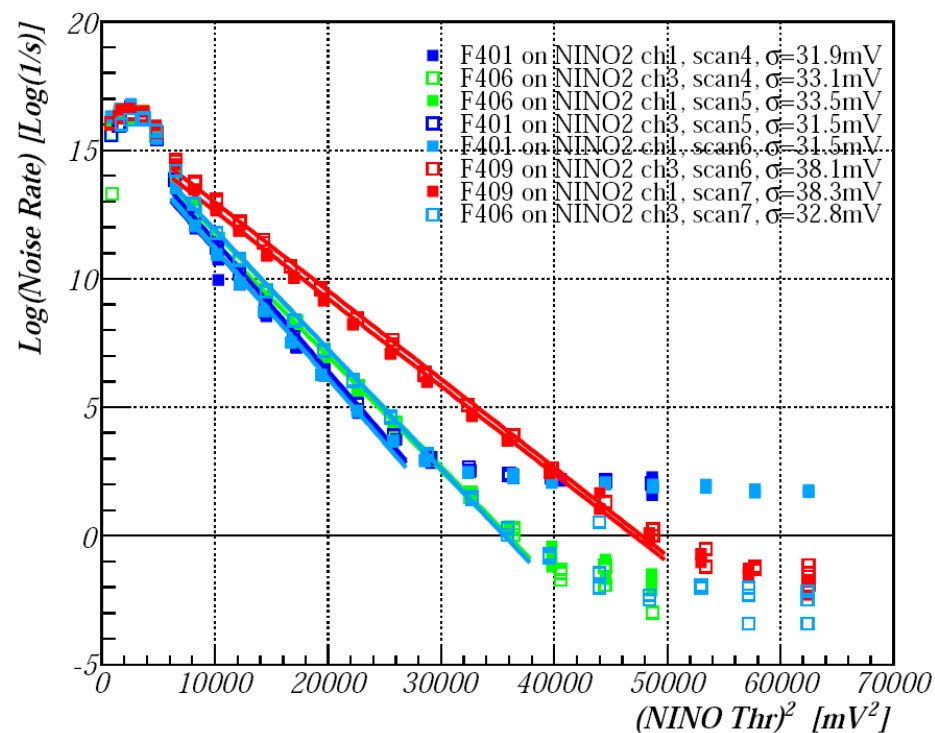


Module	σ [mV]		Thr @ 0.5 eff [mV]	
	ch1	ch3	ch1	ch3
F401	31.9, 31.5	31.5, 32.8	250	250
F406	33.5	33.1	265	250
F409	38.3	38.1	210, 230	210, 230

NINO2 (Helmut)

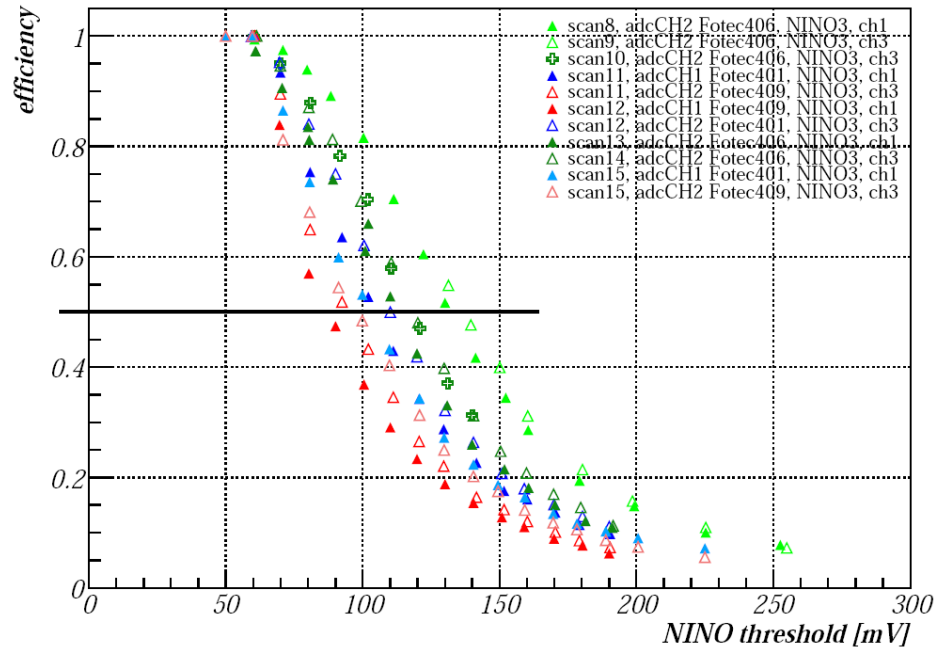


NINO2 (Helmut)



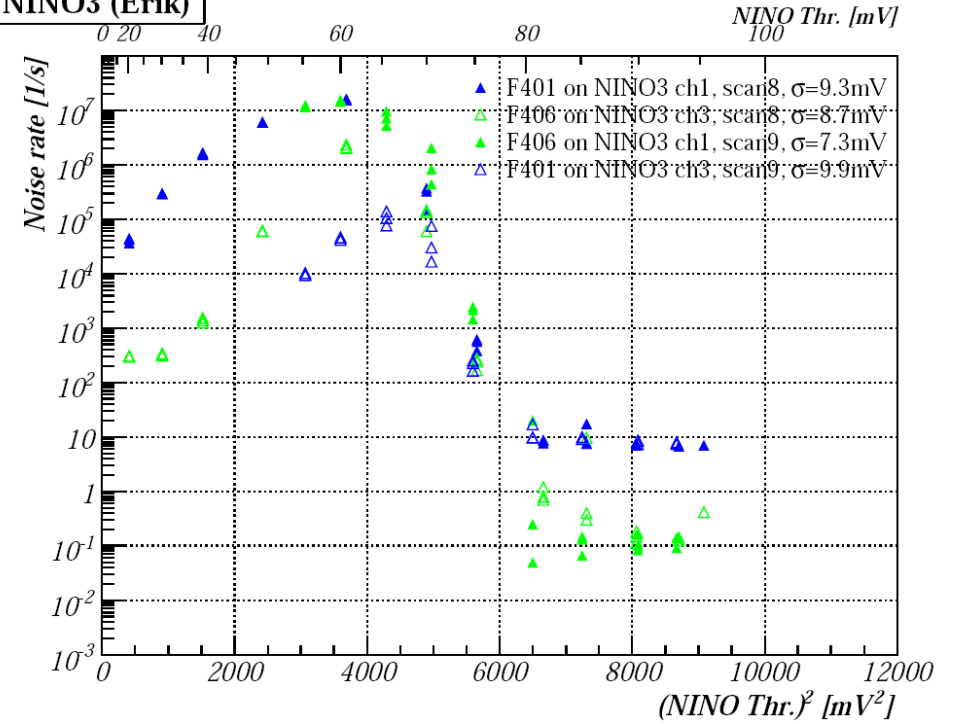
NINO3:

NINO3 (Erik)

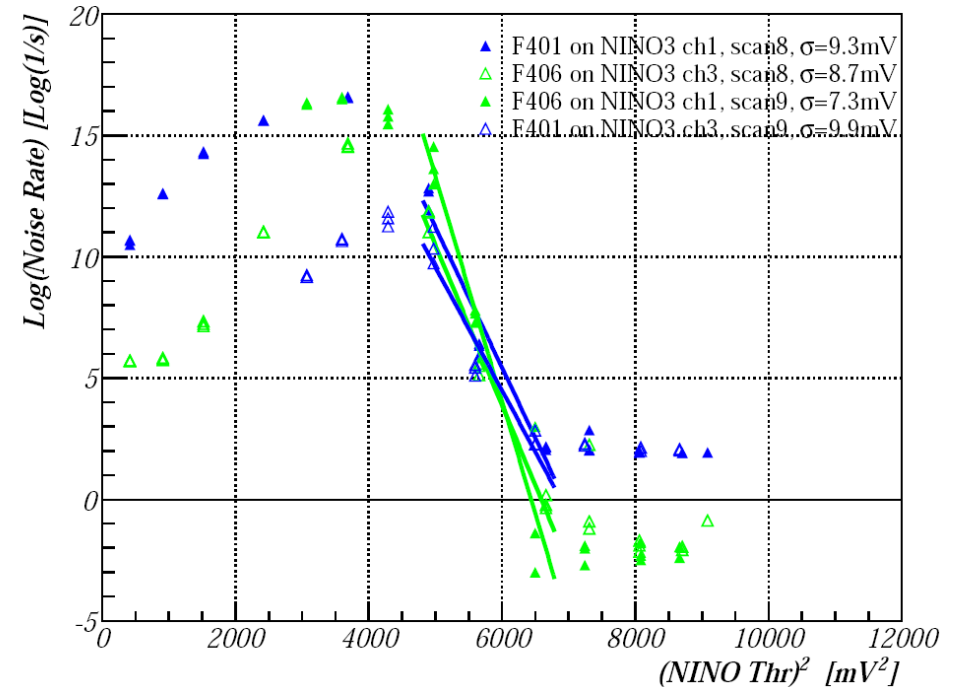


Module	σ [mV]		Thr @ 0.5 eff [mV]	
	ch1	ch3	ch1	ch3
F401	9.3	9.9	105, 105	110
F406	7.3	8.7	130, 110	135, 115
F409	/	/	85	93, 95

NINO3 (Erik)

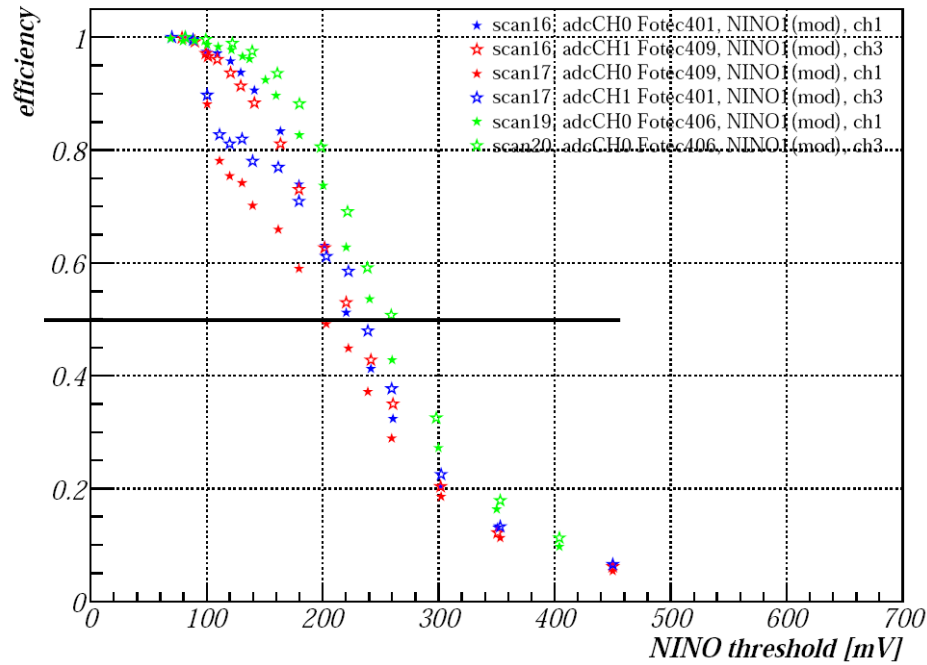


NINO3 (Erik)



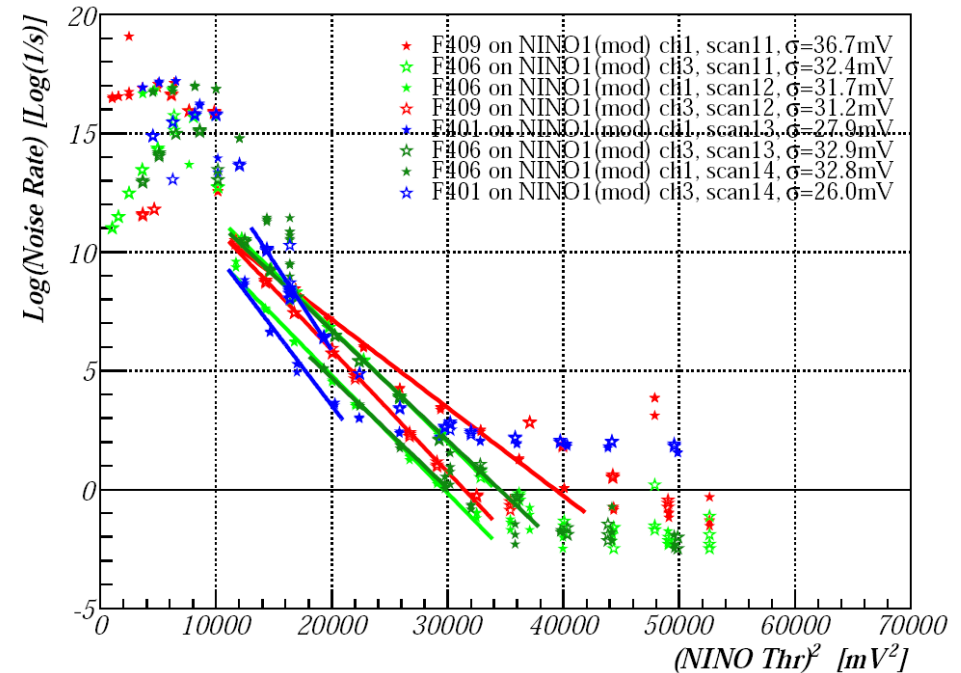
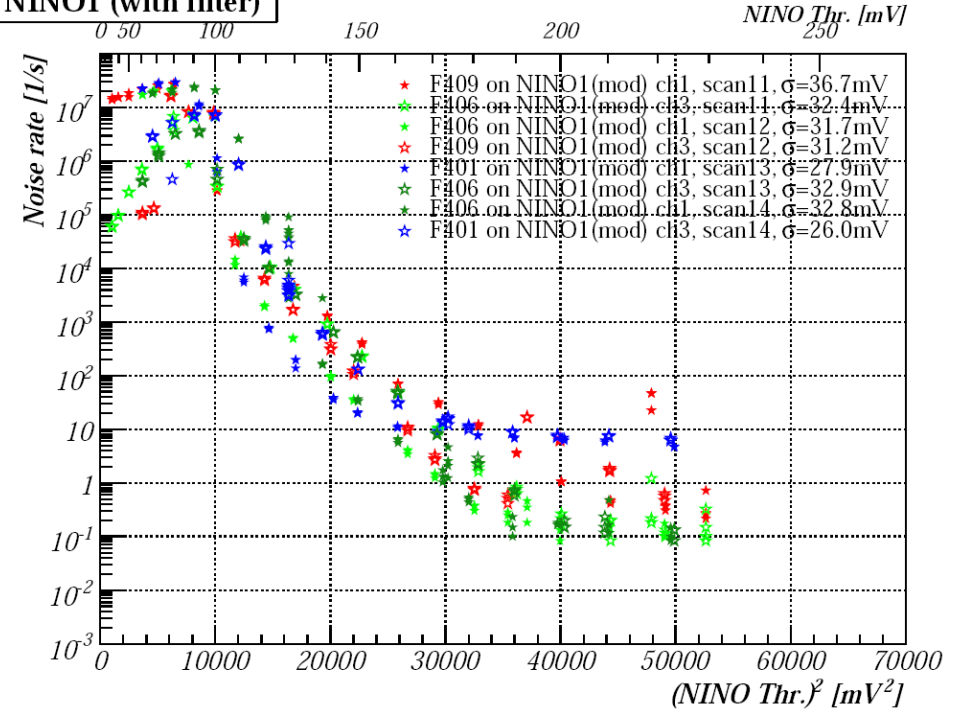
NINO1 mod.:

NINO1 (dodan filter)

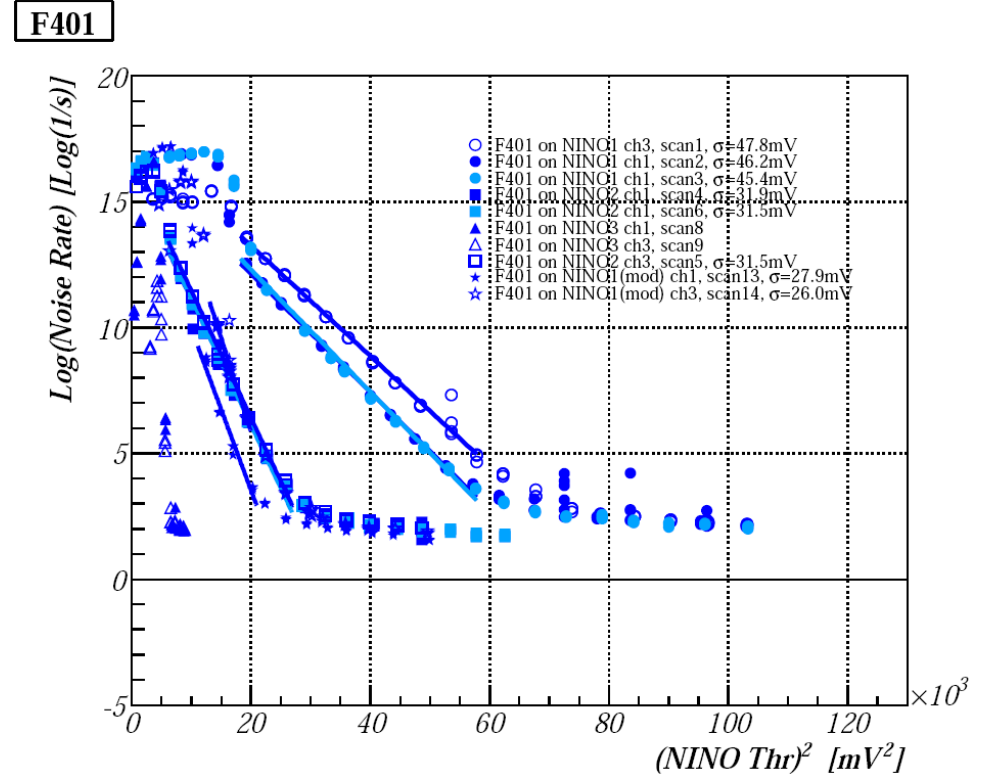
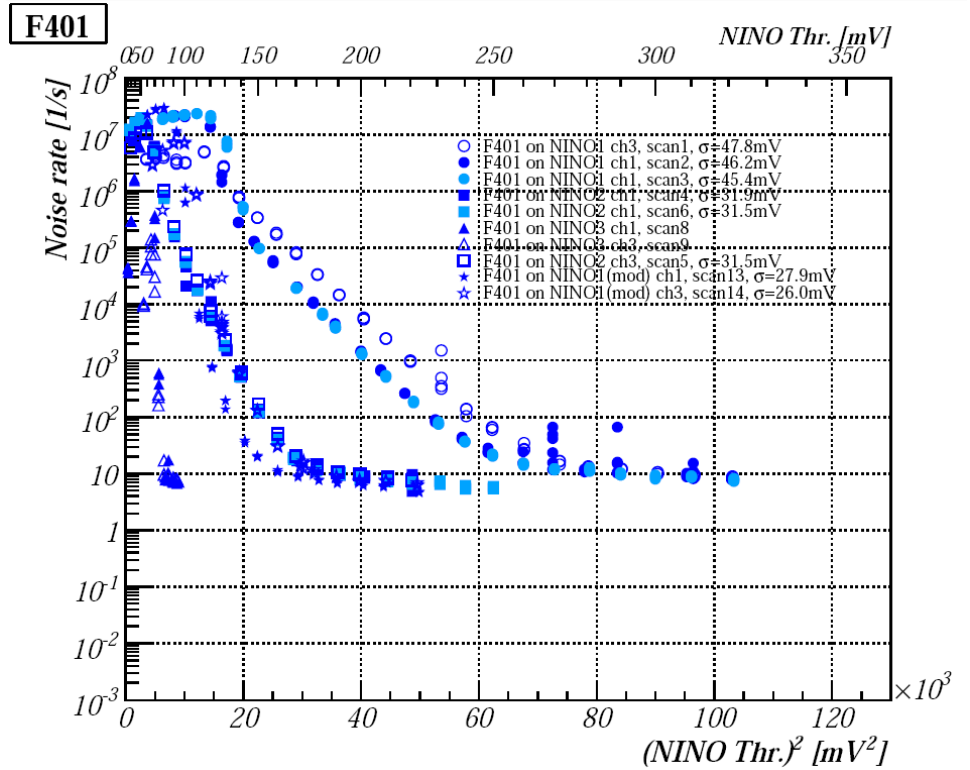
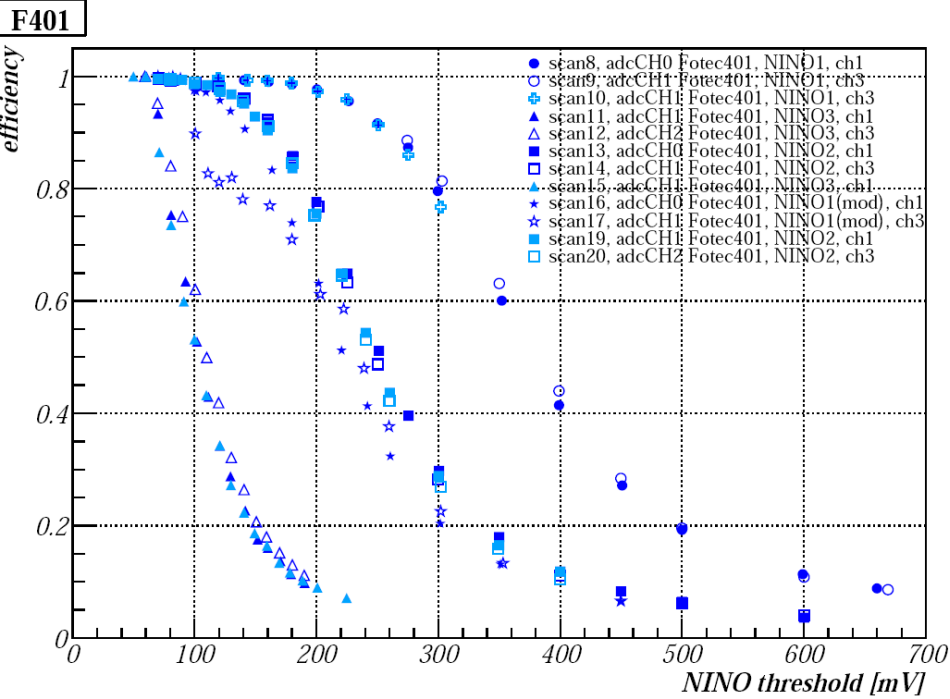


Module	σ [mV]		Thr @ 0.5 eff [mV]	
	ch1	ch3	ch1	ch3
F401	27.9	26.0	225	235 ?
F406	31.7, 32.8	32.4, 32.9	245	260
F409	36.7	31.2	200 ?	225

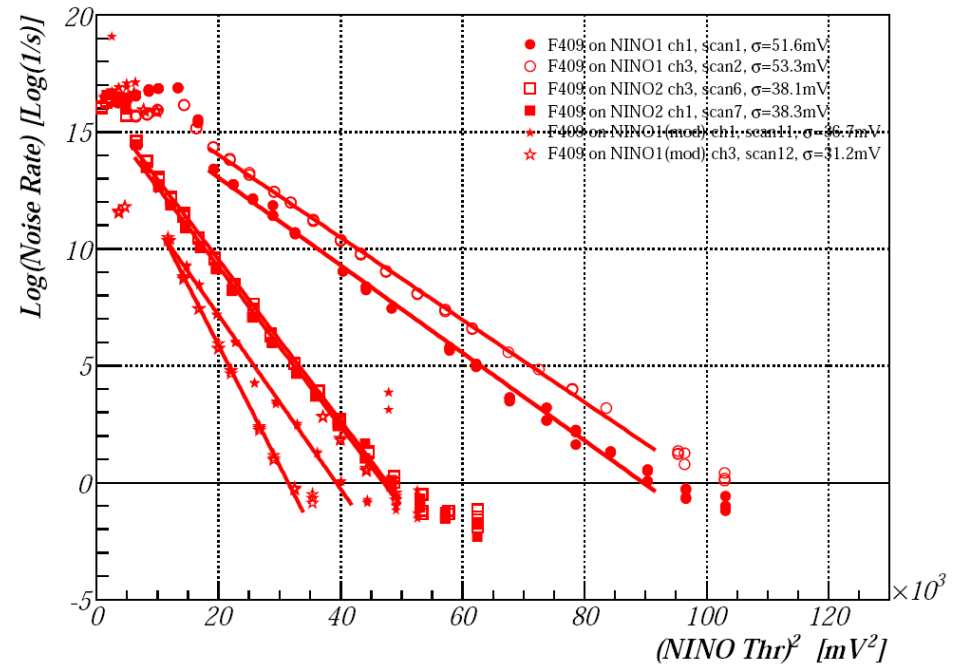
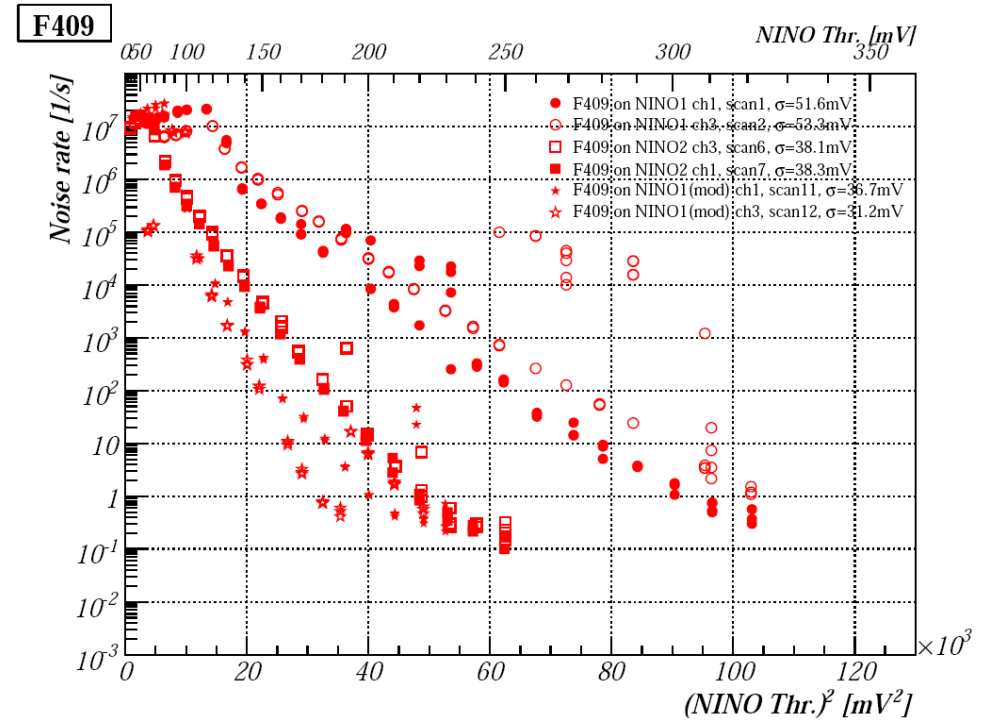
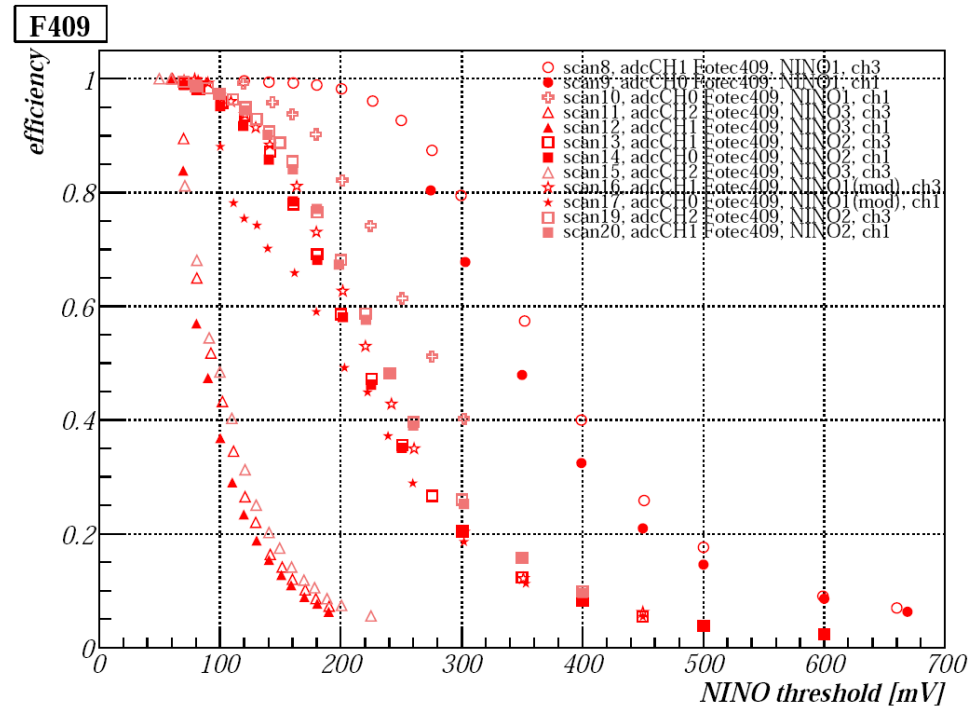
NINO1 (with filter)



F401:

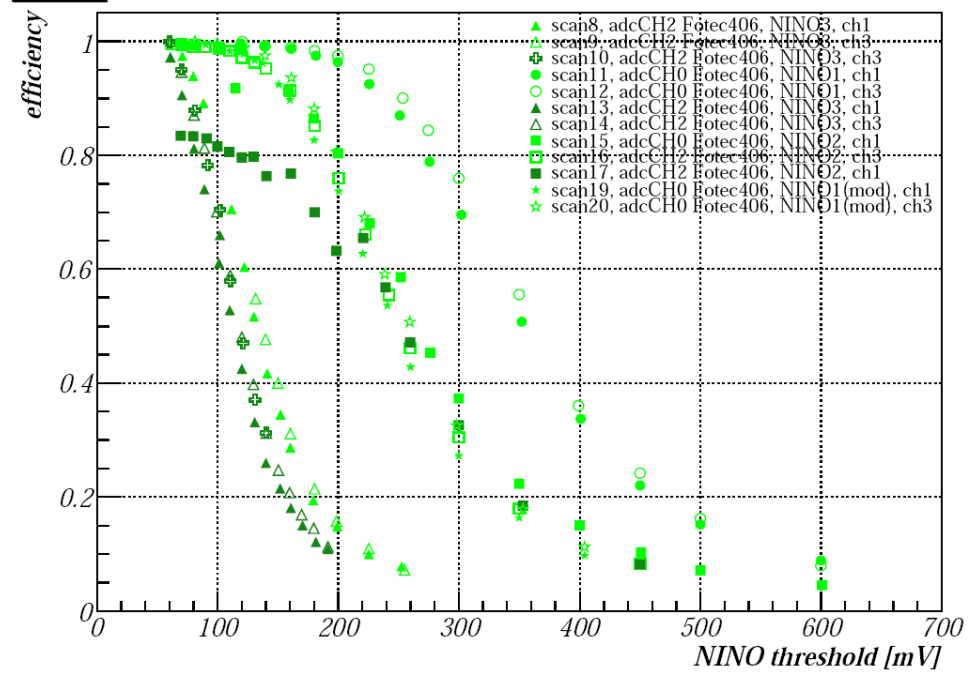


F409:

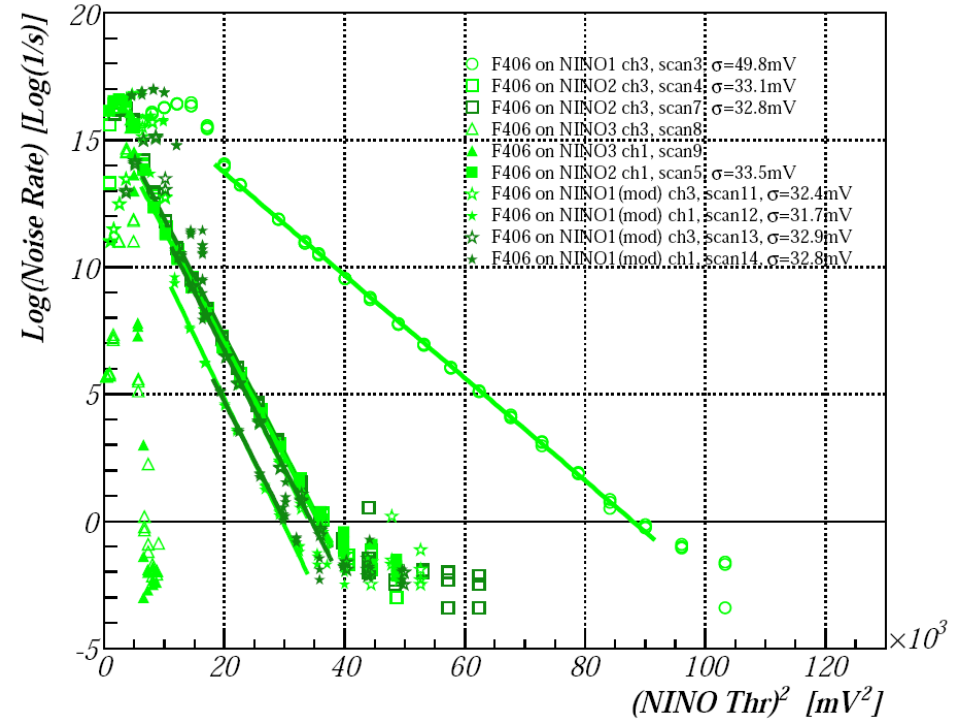
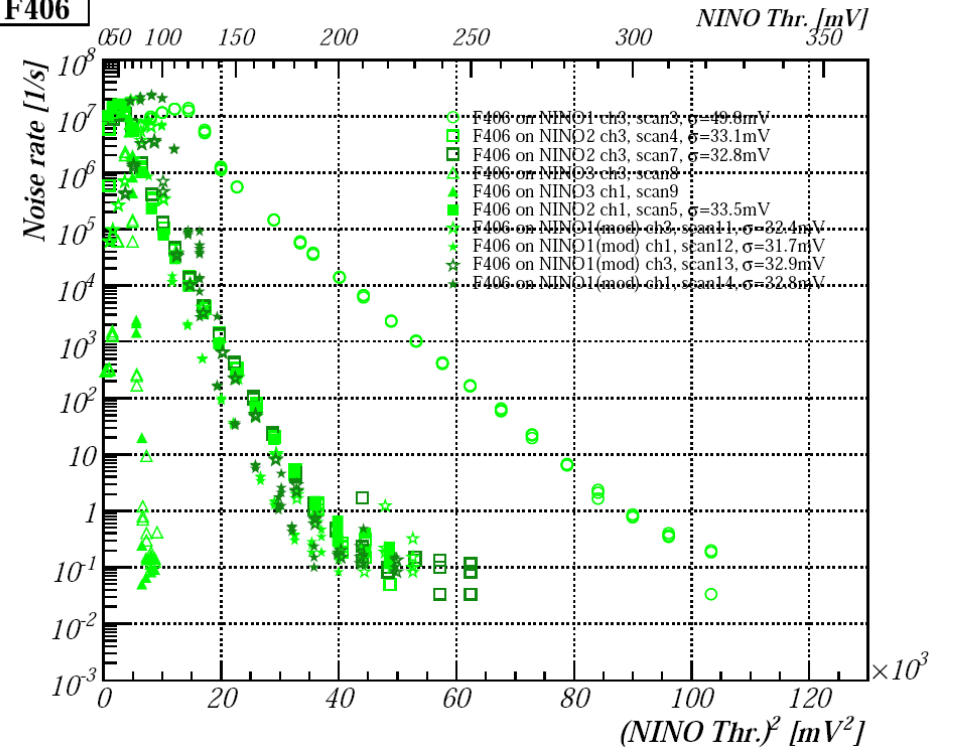


F406:

F406



F406

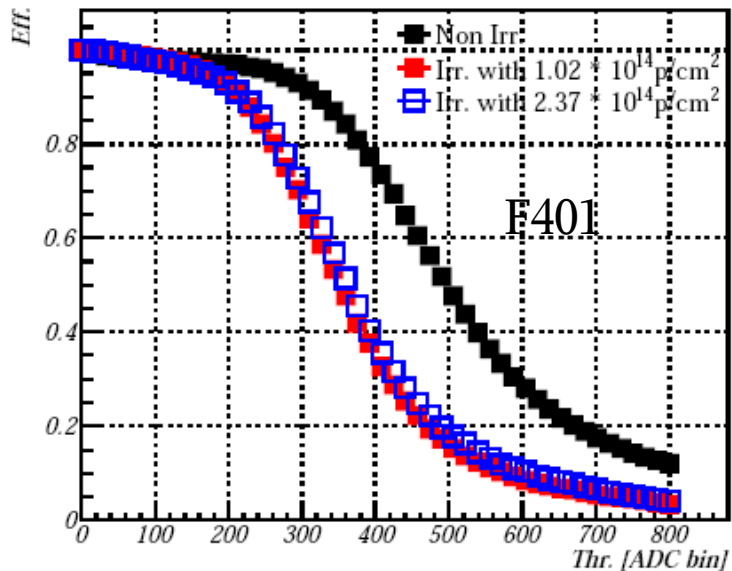


NINO SNR:

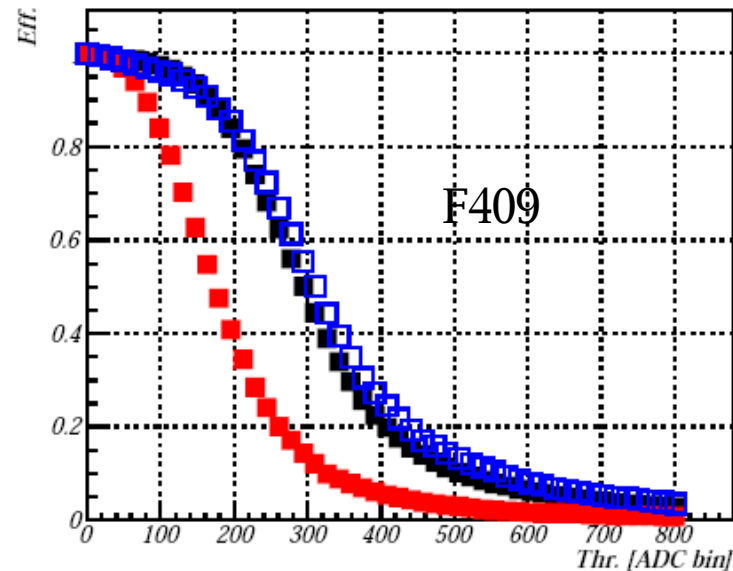
Module	NINO1		NINO2		NINO3		NINO1 mod.	
	ch1	ch3	ch1	ch3	ch1	ch3	ch1	ch3
F401	8.3	7.9	7.9	7.8	11.3	10.6	8.1	9.0 ?
F406	/	7.4	7.9	7.6	16.4	14.4	7.6	8.0
F409	6.6	6.9	5.7	5.8	/	/	5.4 ?	7.2

Efficiency Vs. Threshold: analogue signal @+1000V

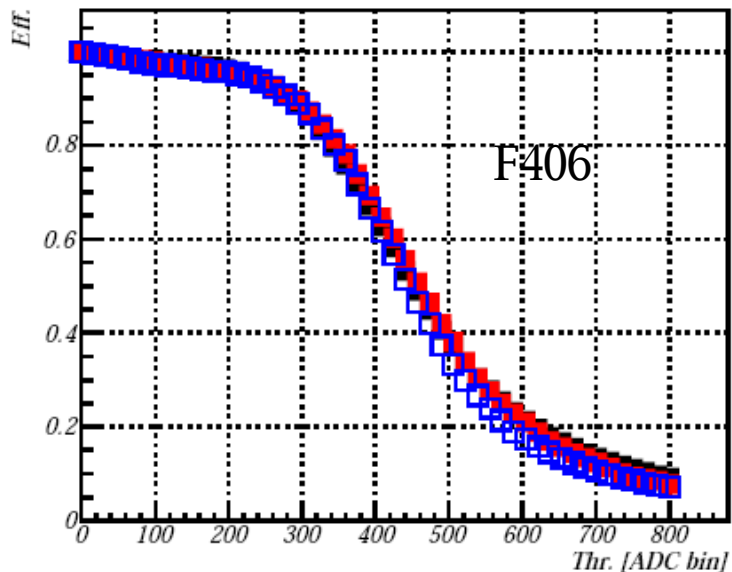
ADCch0, F401, HV=1000V, RUN=1625, X=110.0mm, Y=93.0mm



ADCch1, F409, HV=1000V, RUN=1625, X=110.0mm, Y=93.0mm



ADCch2, F406, HV=1000V, RUN=1625, X=110.0mm, Y=93.0mm



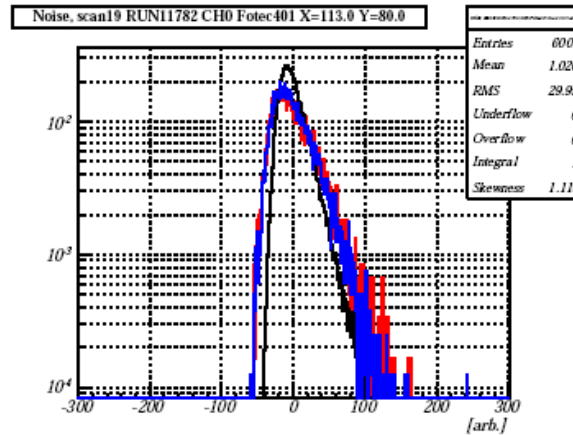
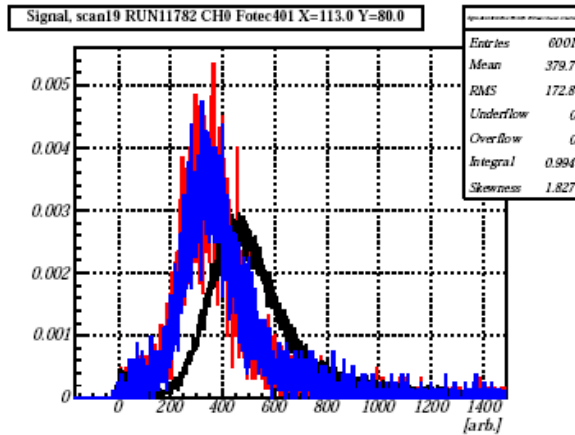
- TB julija 2007 (H8), F401 neobsevan
- TB avgusta 2007 (H6), F401 obsevan z $1.02 \cdot 10^{14} \text{ p/cm}^2$
- zadnji TB oktobra 2007 (H6), F401 obsevan z $2.37 \cdot 10^{14} \text{ p/cm}^2$ (skupna fluenca)

Signal & Noise: analogue signal @+1000V

signal

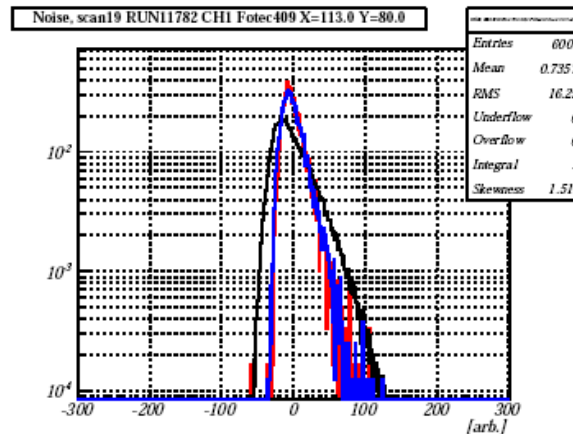
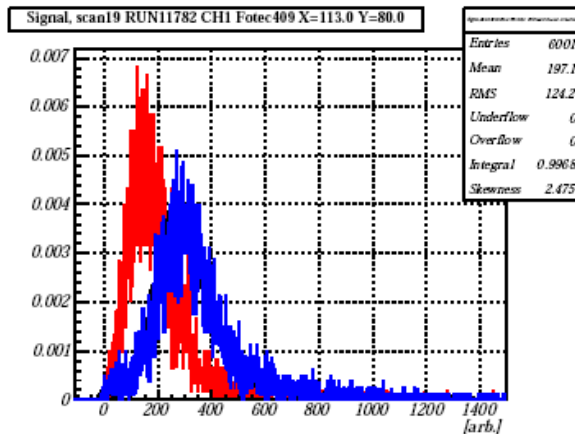
noise

F401



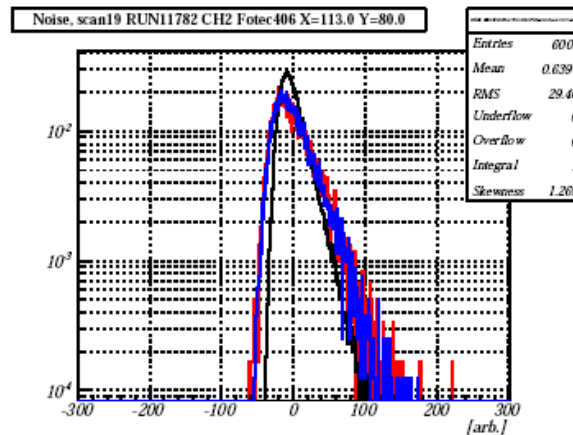
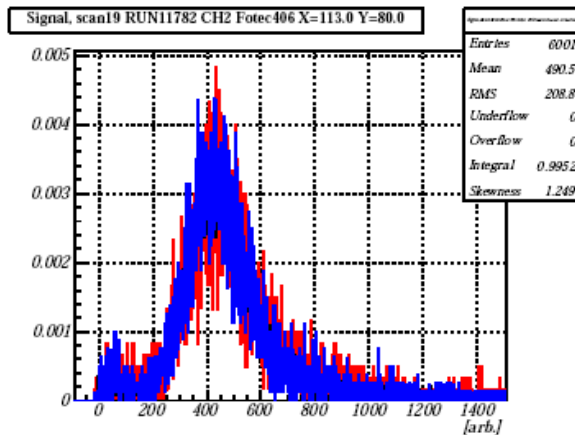
× signal sampled in 2.5 ns interval around average signal

F409



× crna: TB julija
× rdeca: TB v agustu
× modra: zadnji TB

F406



Rezultati iz TB v Avgustu:

NINO2 signali: noise rate

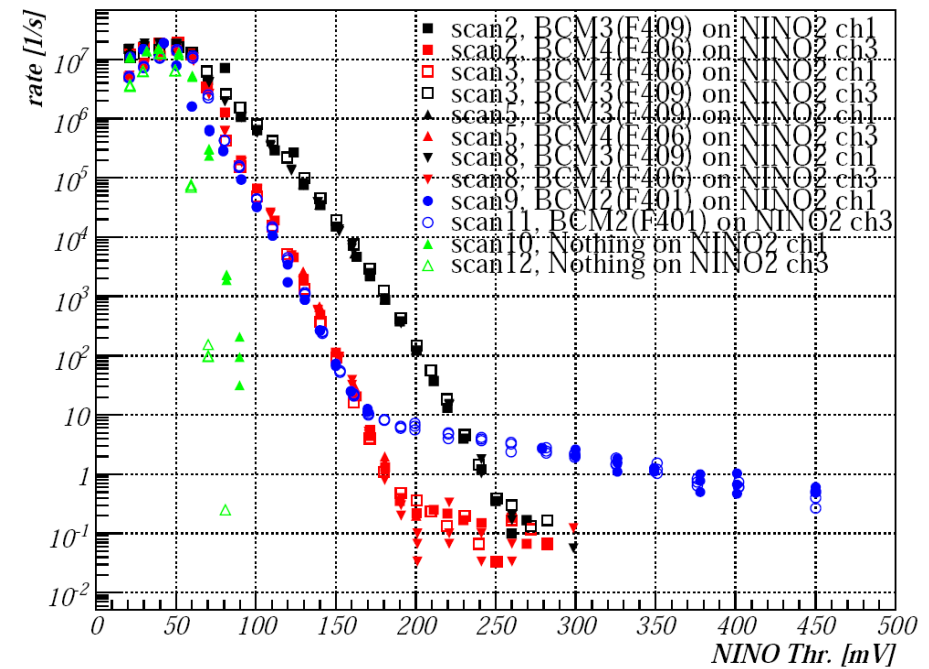
black markers: F409

red markers: F406

blue markers: F401

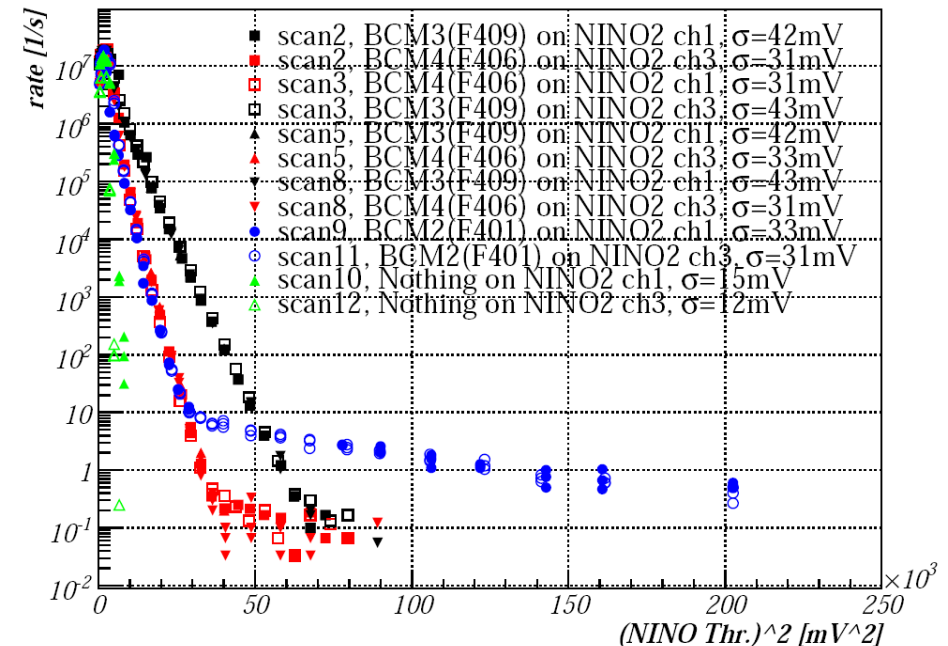
green markers: nothing connected

open/closed markers: different NINO channels (ch1,ch3)



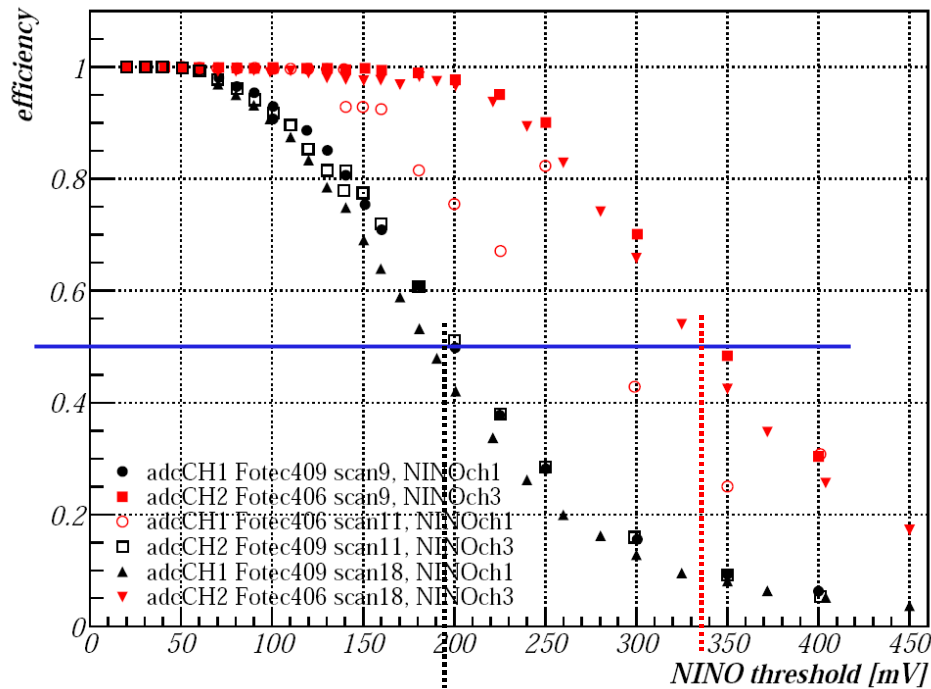
from the fit: $\log(\text{Noise Rate}) = A + \frac{\text{Thr}^2}{2\sigma^2}$

Module	σ [mV]
F401	32
F406	31
F409	43
/	12(ch1), 15(ch2)



Rezultati iz TB v avgustu

NINO2 signals: efficiency



searching for signal in 50ns time interval

black markers: F409

red markers: F406

open/closed markers: NINO inputs swapped

○ ???

persist. plot for run with 200mV threshold:

F406

✗ median efficiency at $\sim 335\text{mV}$ and σ from noise rate fit give SNR ~ 10

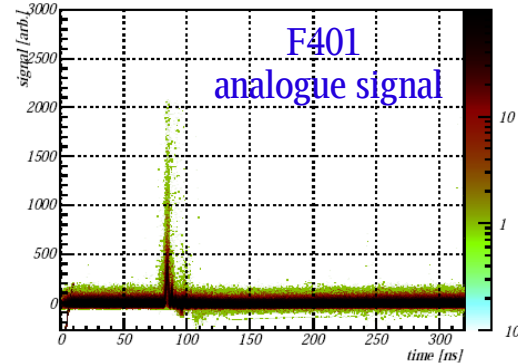
✗ from QA: SNR ~ 10 if normalized to 45°

F409

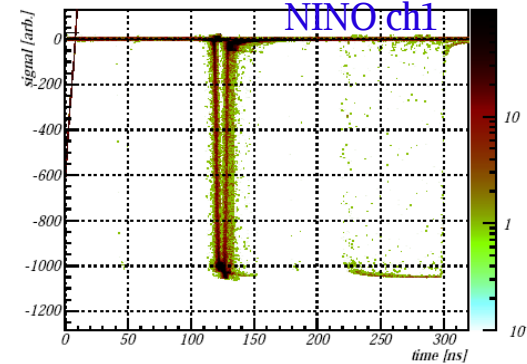
✗ median efficiency at $\sim 195\text{mV}$ and σ from noise rate fit give SNR ~ 4.5

✗ from QA: no data for pos. polarity

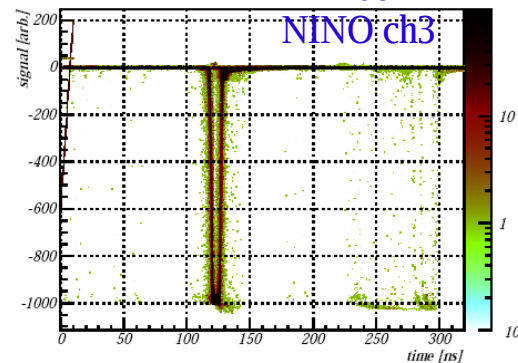
WFpersist CH0, F401, run1029



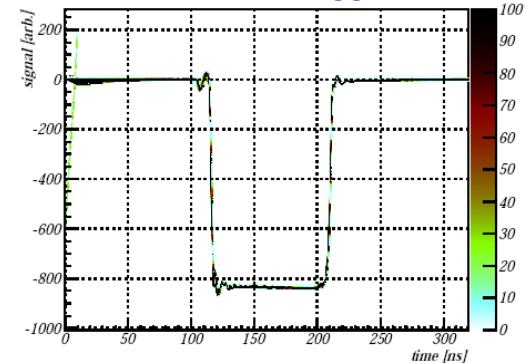
WFpersist CH1, F409, run1029



WFpersist CH2, F406, run1029

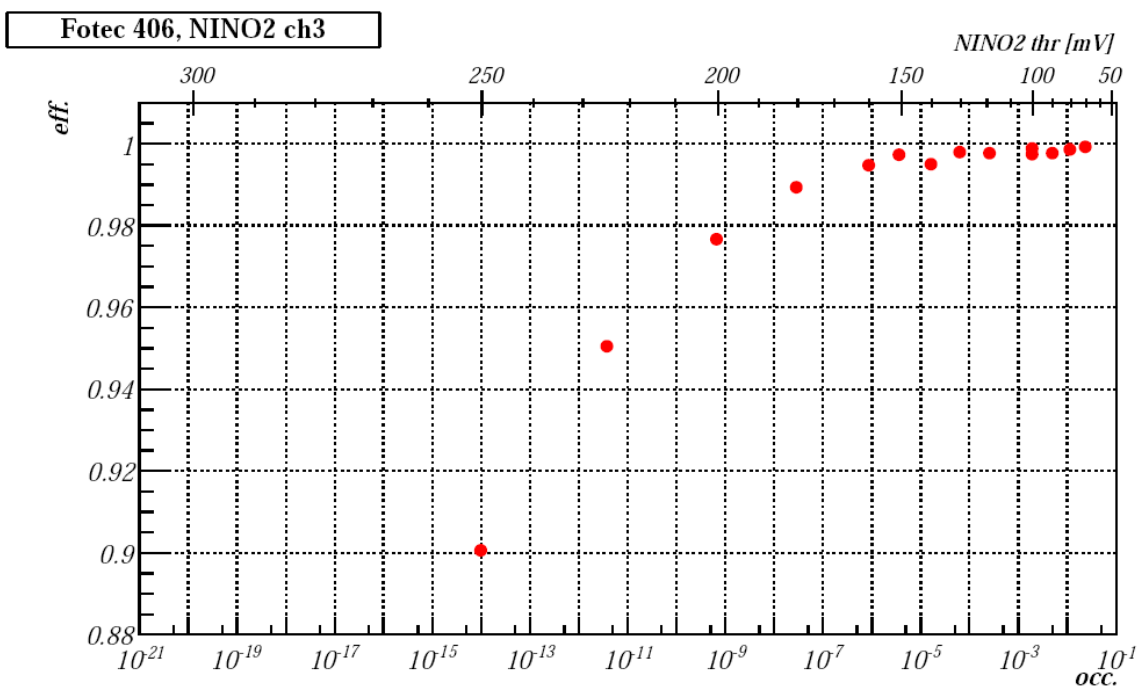


WFpersist CH3, F1, run1029



Rezultati iz TB v avgustu:

NINO2 Efficiency Vs. Occupancy for F406



- × efficiency calculated from ADC data
- × occupancy (in 25 ns time interval)
calculated from fit to Noise rate
measurement for a given efficiency data
point

NINO2 Thr [mV]	Eff.	Occ.
180.4	0.99	$2.9 \cdot 10^{-8}$
200.4	0.97	$6.7 \cdot 10^{-9}$
225	0.95	$3.7 \cdot 10^{-12}$
250.2	0.90	$9.9 \cdot 10^{-15}$
300.4	0.70	$1.1 \cdot 10^{-20}$