



News from FEV8_COB



Roman Pöschl

... on behalf of



Funding through:



HIGHTEC



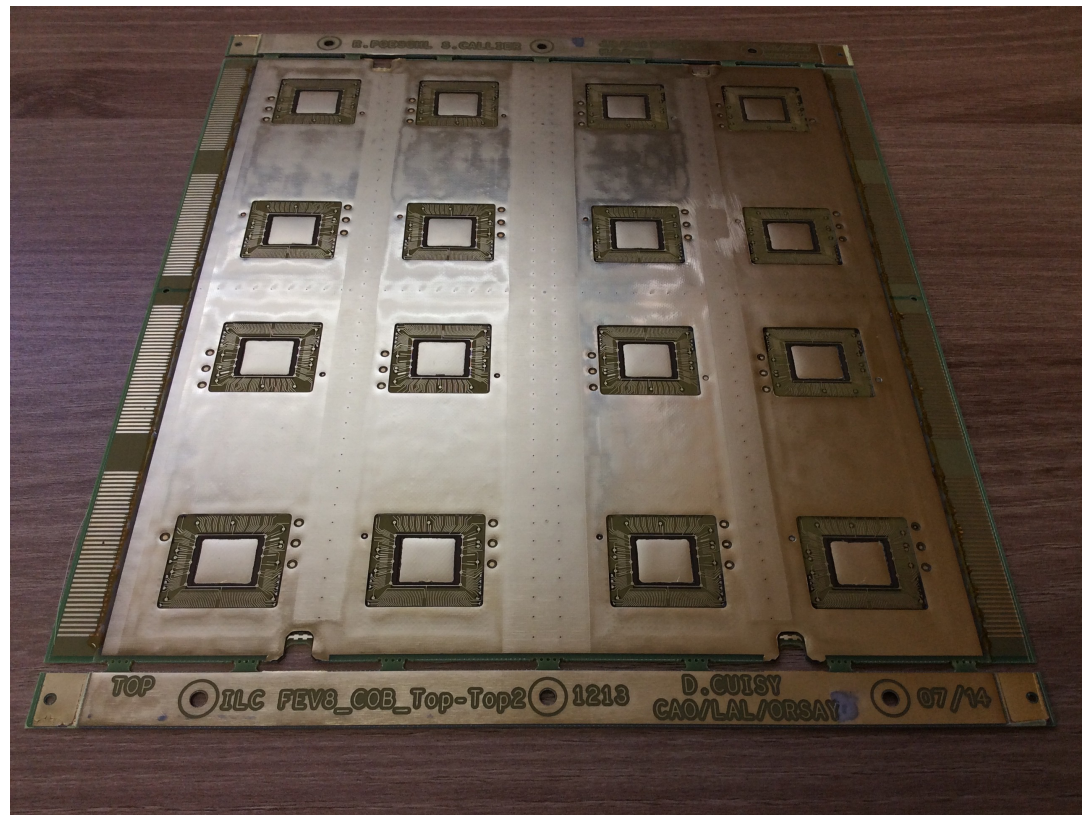
PHC Star: RECFEB



FKPPL

CALICE Meeting at Arlington/TX – September 2016

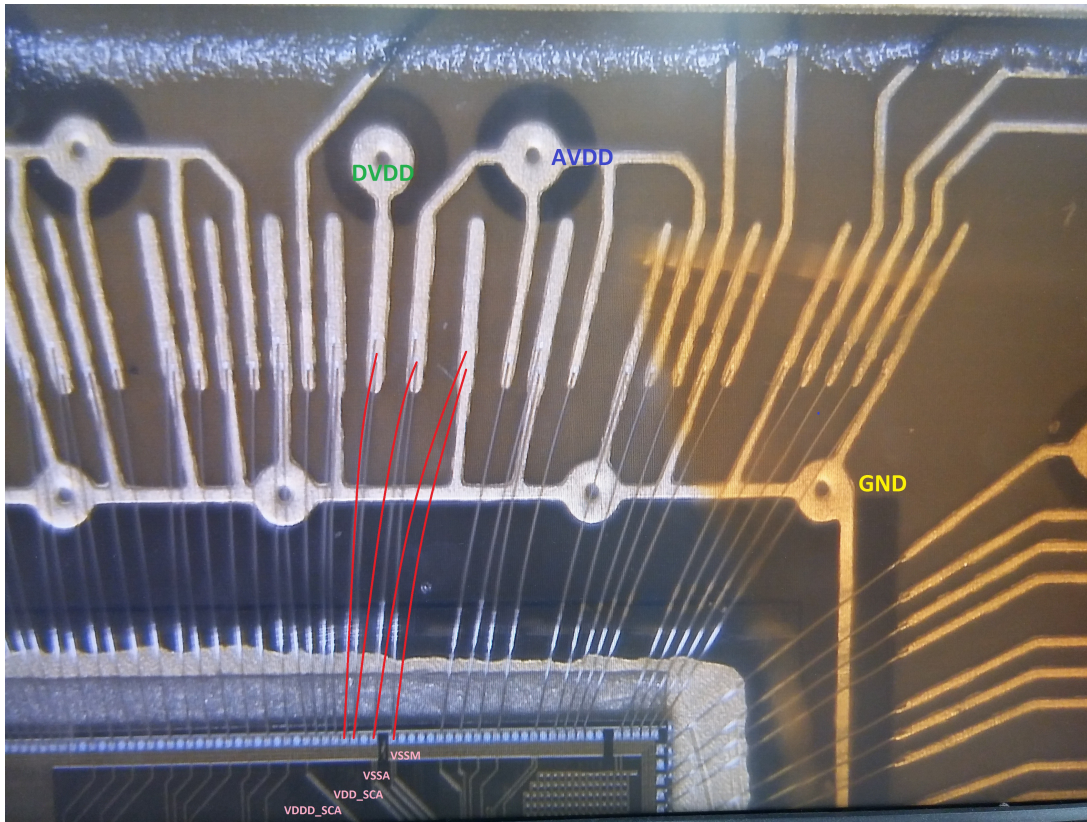
- Produced by EOS Company South-Korea under supervision of SKKU/OMEGA/LAL
10 board production autumn 2014, Four boards sent to LAL
- 2 Boards wire bonded at CERN in March 2015
- First debugging series at LAL in Summer/Autumn 2015



Support by:



LPNHE

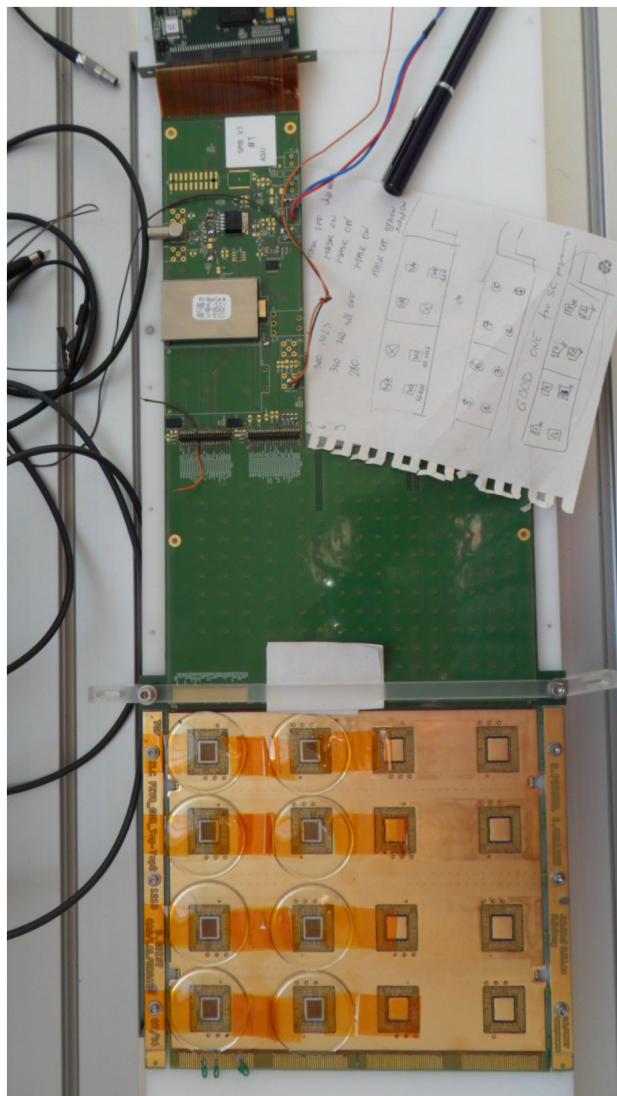


- Second PCB could not be started due to short cut
- Correction by CERN bonding lab at the beginning of march + 'fresh' bonding of a third board
- **Both manipulated boards are now operational**
- **Start of new test campaign at the beginning of April 2016**

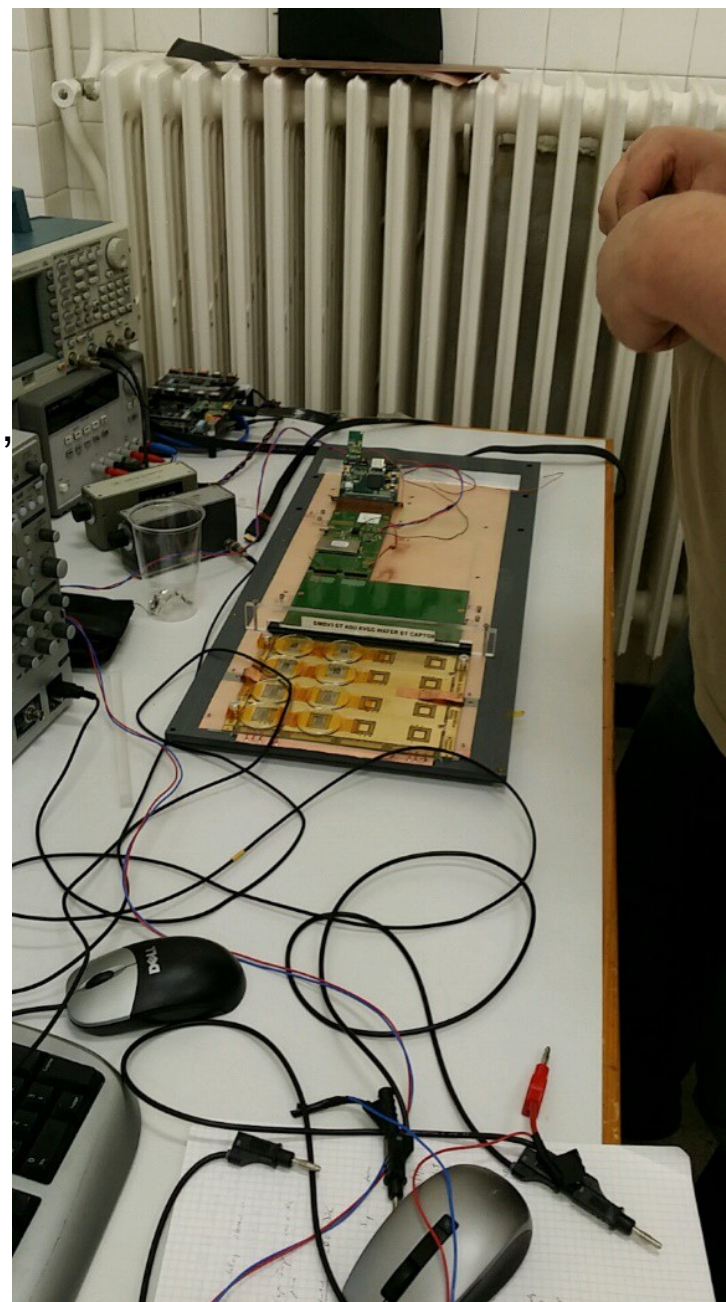
All following measurements by **Abbas Chamseddine**, internship student at LAL

- Board #2: Seven ASICs operational
- Board #3: All eight ASICs operational

... will concentrate on Board 3 (freshly bonded one), all results for low gain 6 pF of SKIROC ASIC



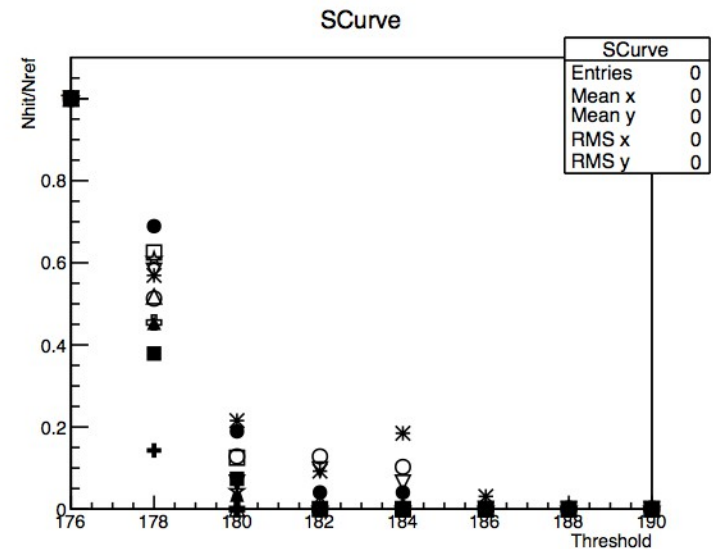
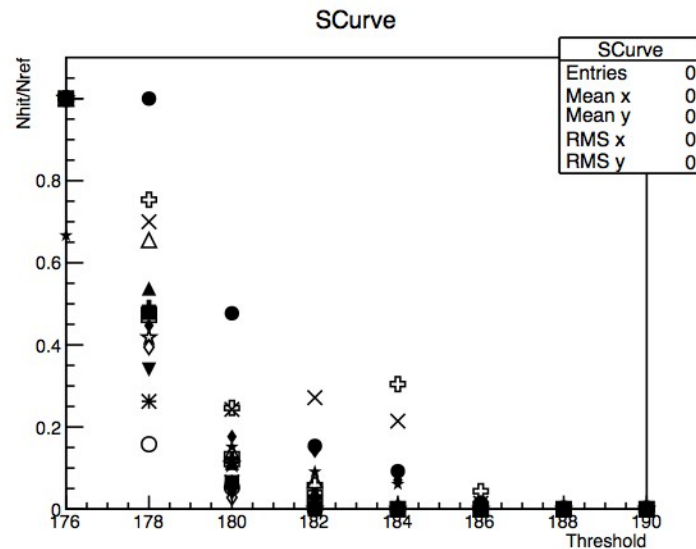
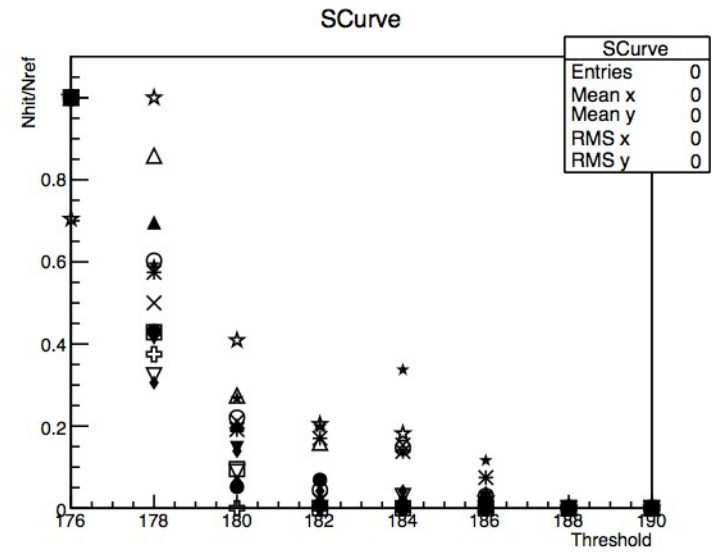
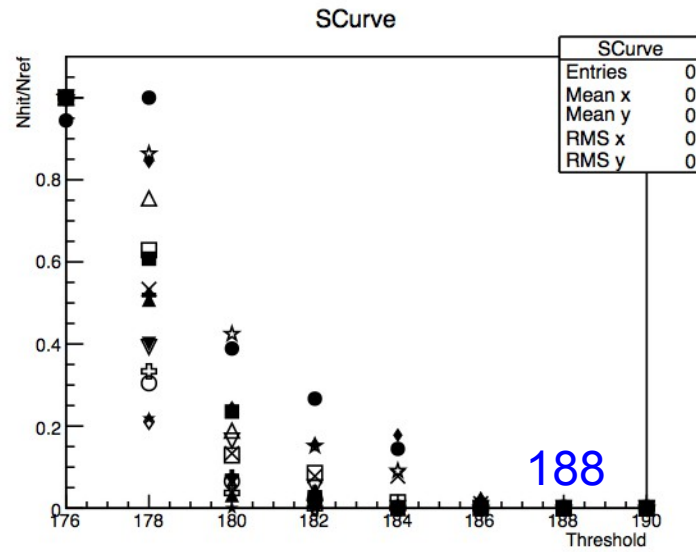
DAQ,
Power sources,
pulsers





S-Curves ASIC0: w/o charge injection

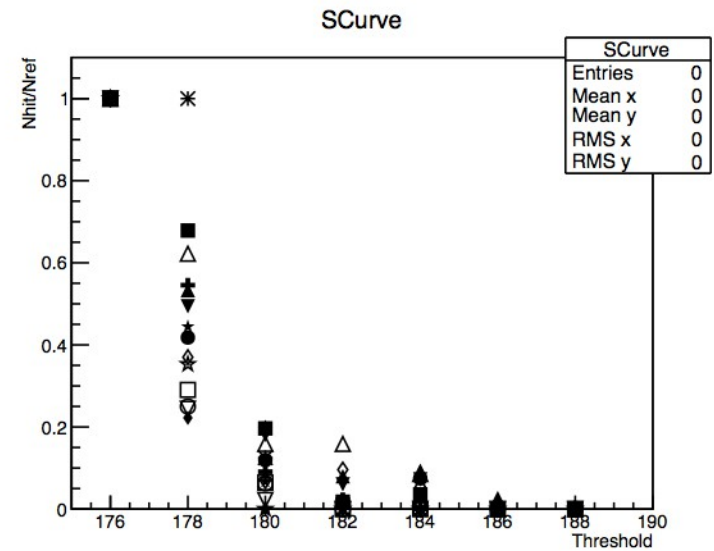
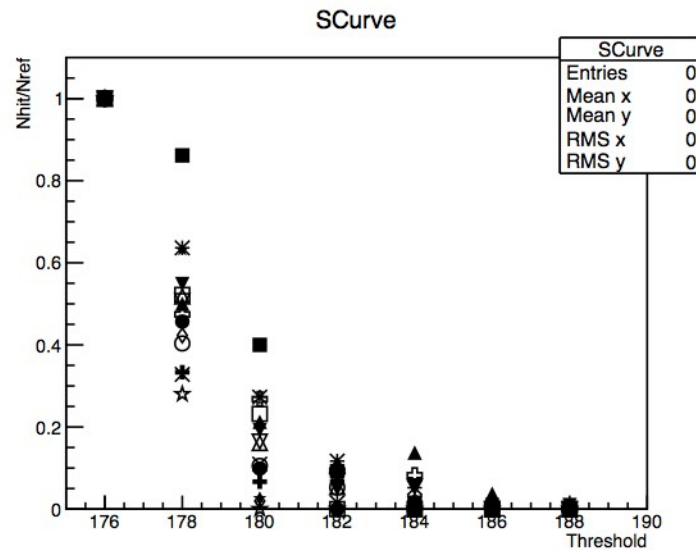
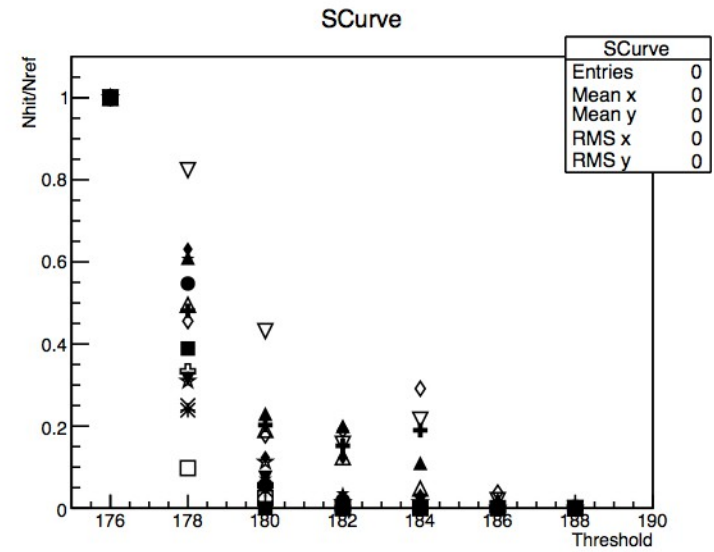
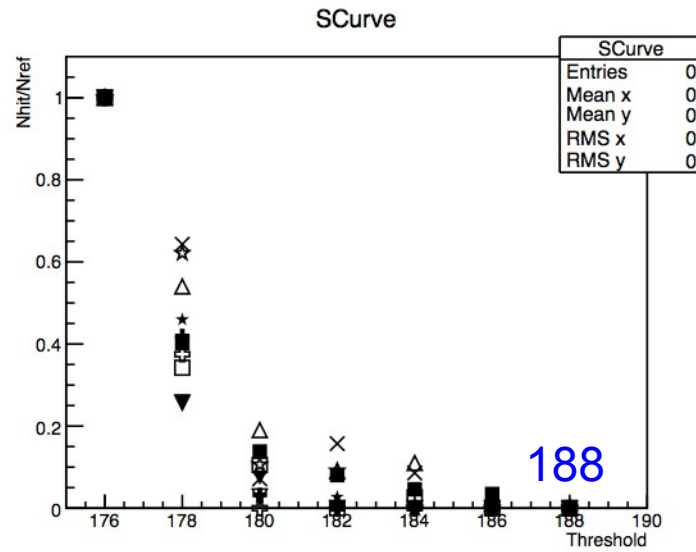
S-Curve obtained
by a successive
lowering of
ASIC Trigger threshold



In general rather smooth behaviour even w/o charge injection
some disabled channels though



S-Curves ASIC3:
w/o charge injection

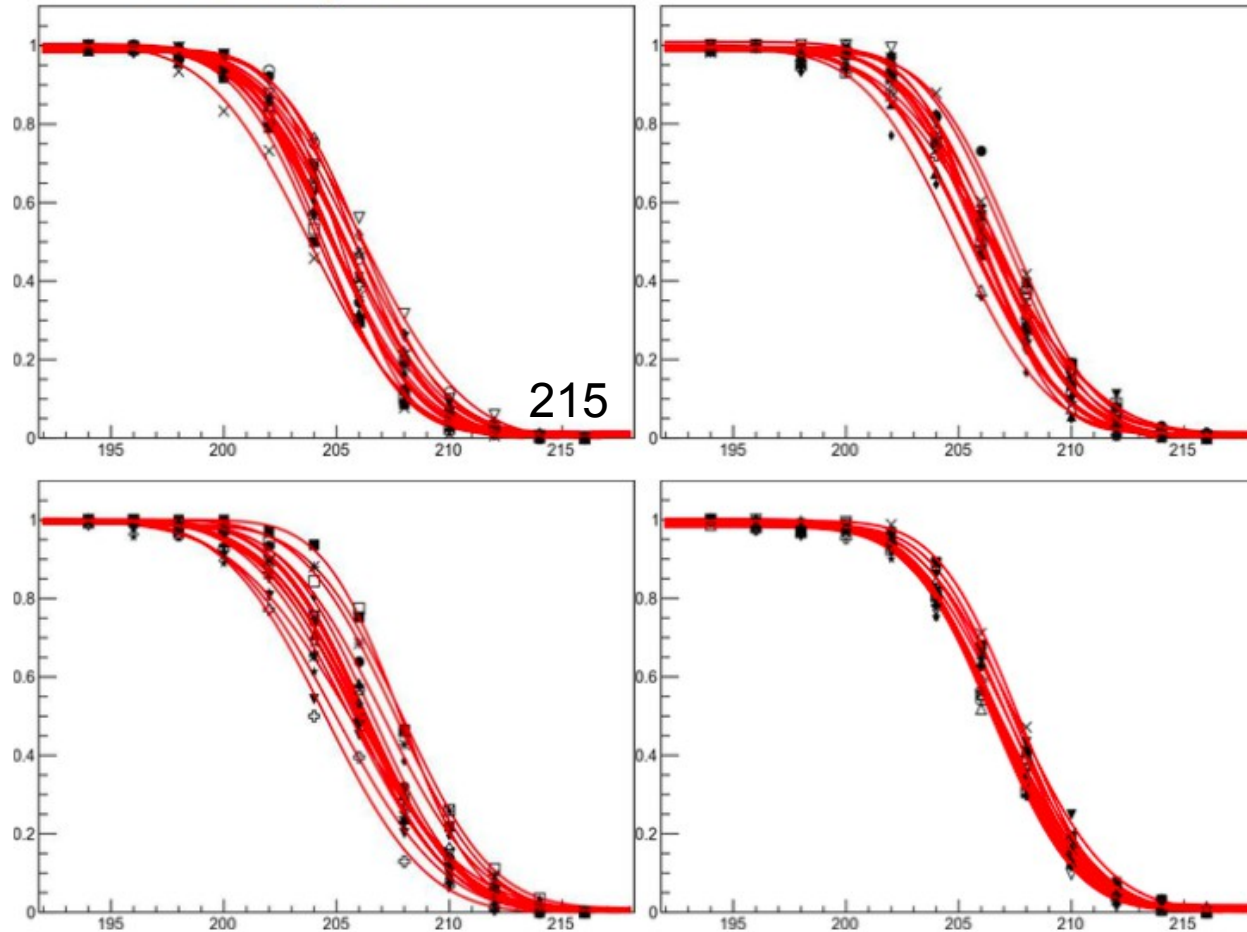


In general very smooth behaviour even w/o charge injection



S-Curves ASIC3:
with charge injection
~2 MIP

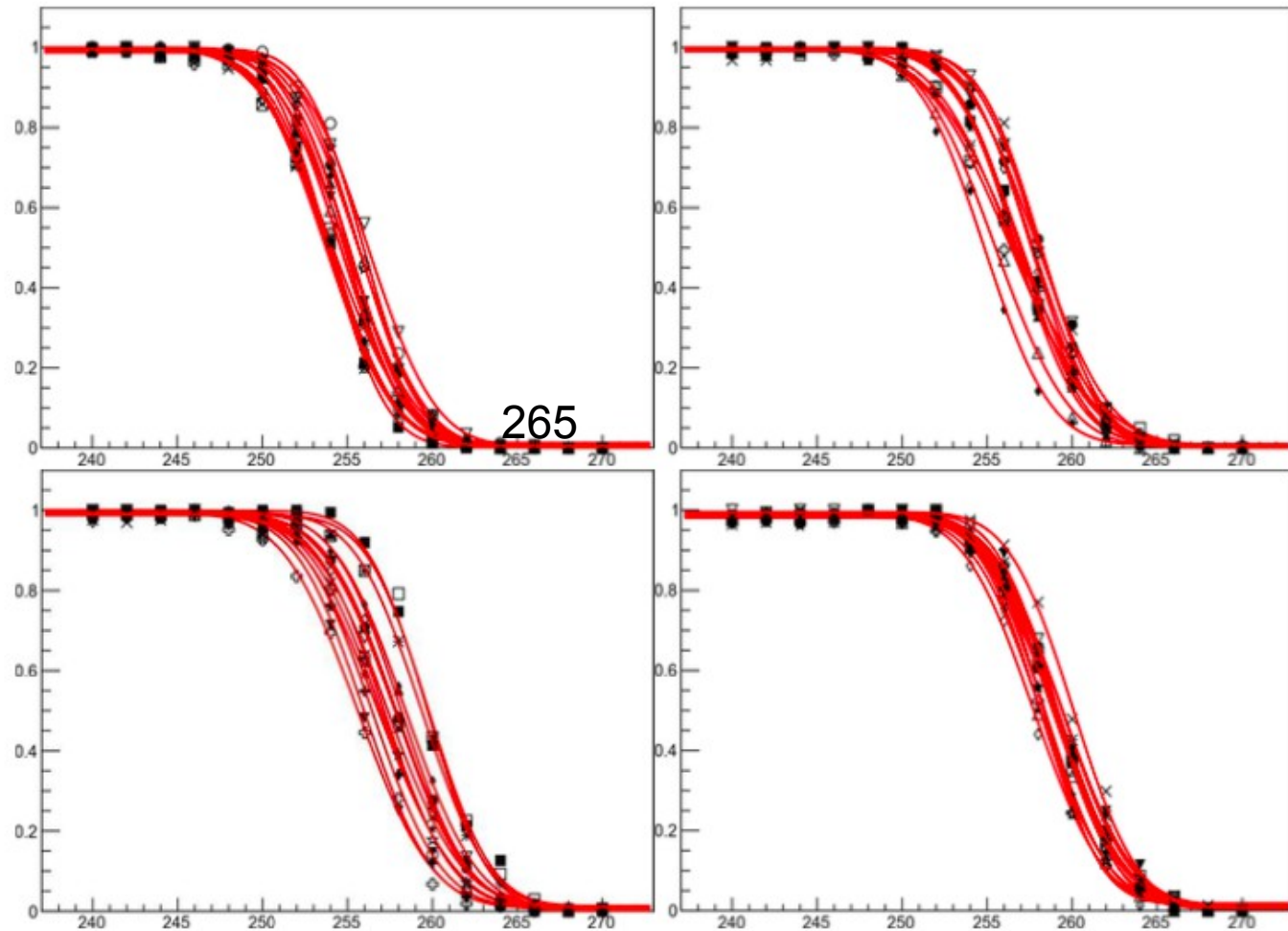
ASIC 1, 2





ASIC 2

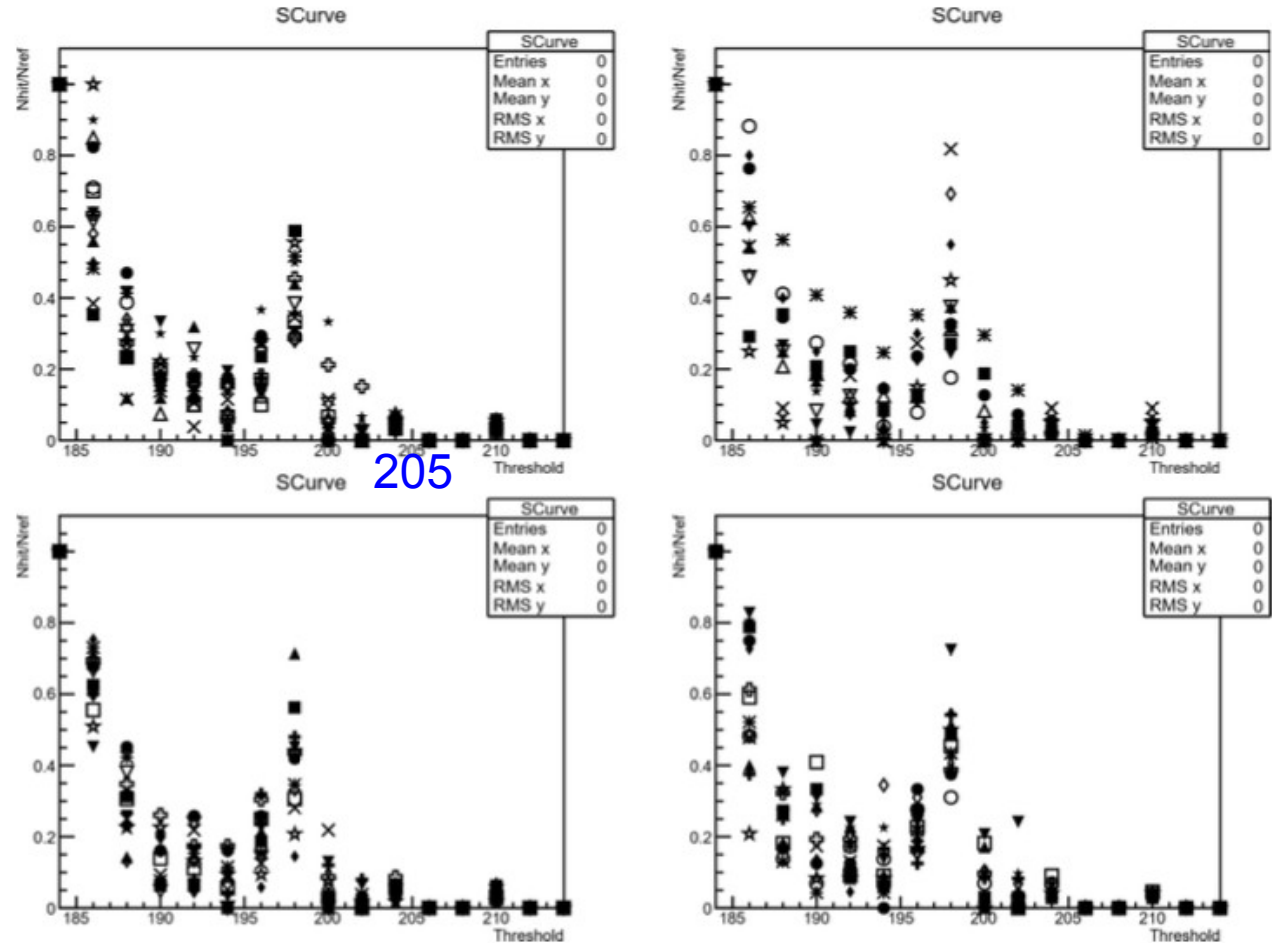
S-Curves ASIC2:
with charge injection
~5 MIP





ASIC 2

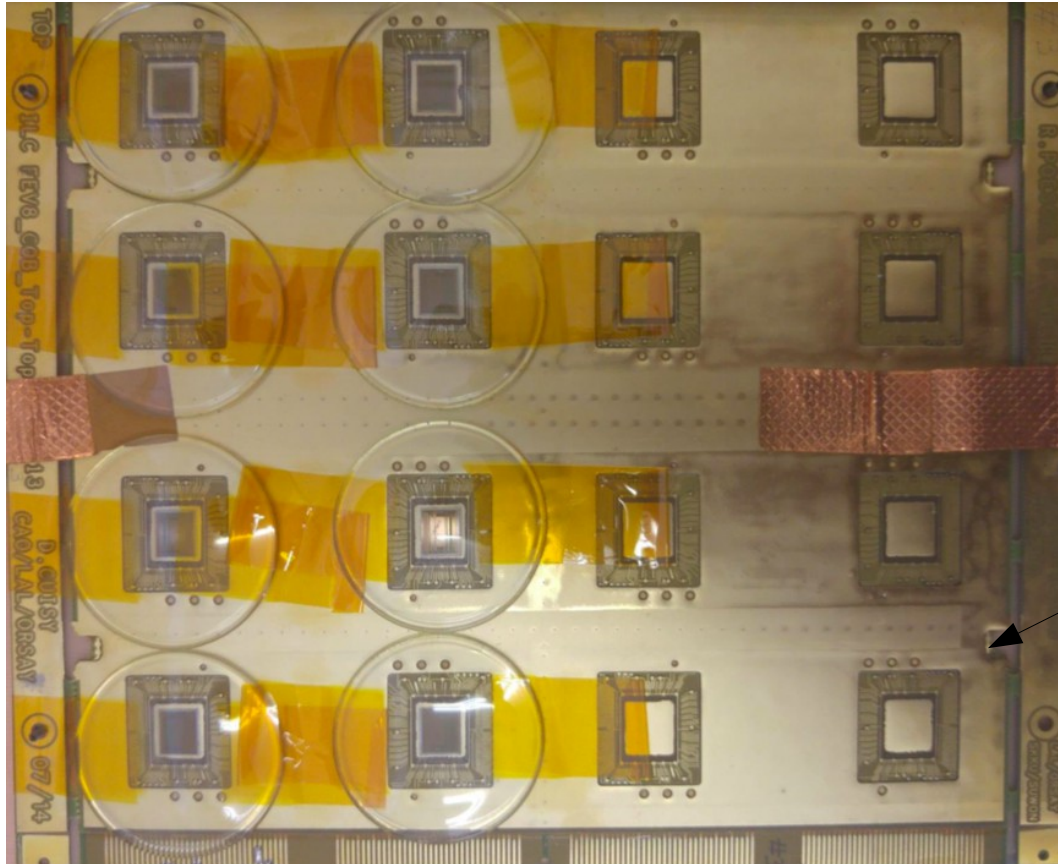
S-Curves ASIC2:
w/o charge injection
Gain 1.2pF (High Gain)



Not too bad but further studies are needed
(and this is one of the better one [according to summerstudent studies])



- Continue debugging that started in Spring 2016
 - No show stoppers observed so far
 - Extract as much information as possible from the current series, dedicated analysis
 - More results at difference SKIROC pre-Amp gains
 - Continuous mode and power pulsing, optimised light shielding
 - Equip PCBs with (Baby) Si Wafers
- Prepare production of new PCBs
 - Proper shielding of ASIC pre-amps (current board still contains this bug????)
 - FEV8 -> FEV11 scheme (ongoing between CAD group of LAL and OMEGA)
- PCB from next series should become part of regular CALICE beam test setups
- Meeting with EOS company 13/5/16
 - Emphasis on mechanical properties
 - Revision of metallisation of bonding pads (Check General Metal Finishing)
 - Strive for all-Korean solution (i.e. Board, ASIC Bonding and encapsulation)
 - Next meeting at EOS envisaged for December 2016
- Meeting at LPNHE about gluing issues 8/9/16
- Will migrate to new DAQ Hardware
 - Material for test benches LAL and SKKU,
 - SKKU colleagues will be trained at LAL before taking it to Korea (January 2017)



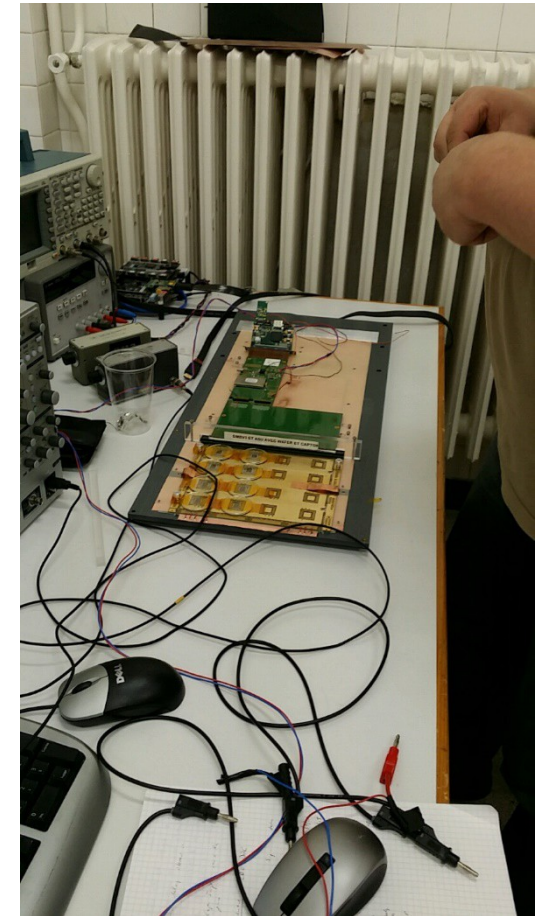
- Adequacy for gluing will have impact on design
- In general flat surface should be beneficial for application of robot
Devil is in the details
- e.g Probe point may need to be replaced to assure aspiration
- Submission of new FEV11_COB scheme should preferable happen in coordination with gluing experts

(N.B.: and assembly experts of course)

Backup

Intensive debugging during September 2015

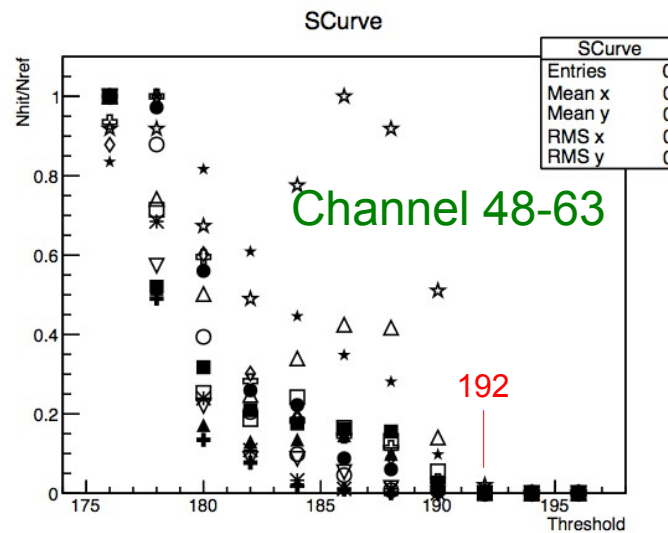
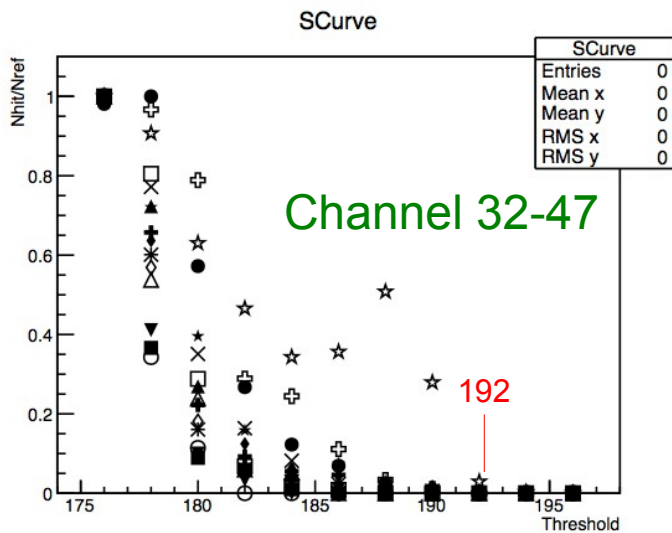
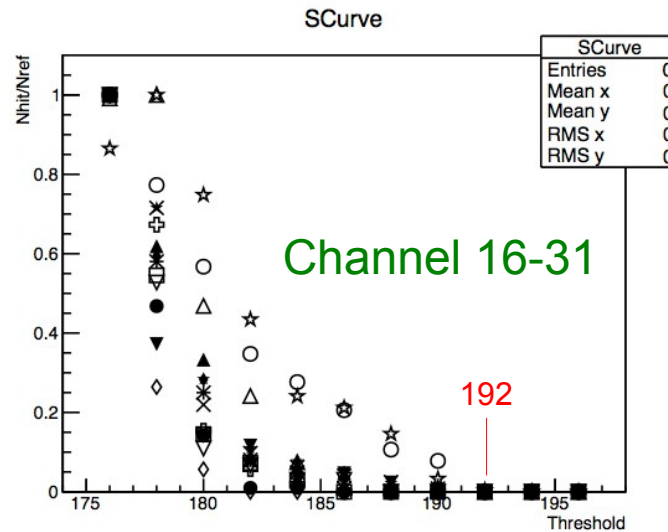
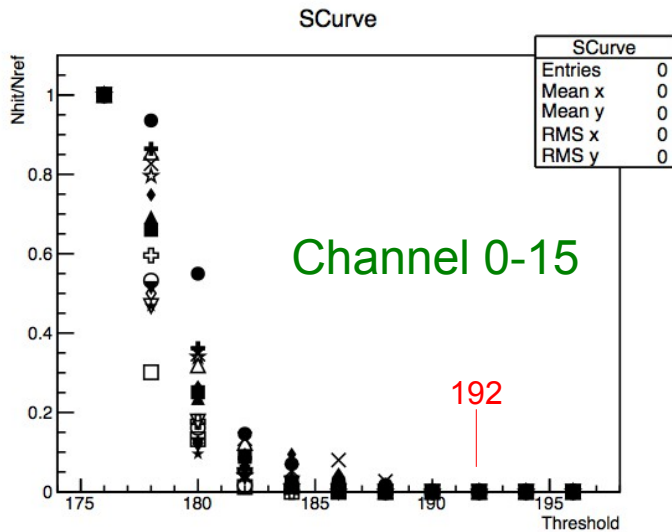
Visit of two students from SKKU and one from Kyushu, possible thanks to FKPL



Team from SKKU (Korea), OMEGA, LAL and Kyushu

Particular thanks to Hiroto for helping to get the SKKU team going!!!!

Chip0 after disabling of 7 channels: No charge injection

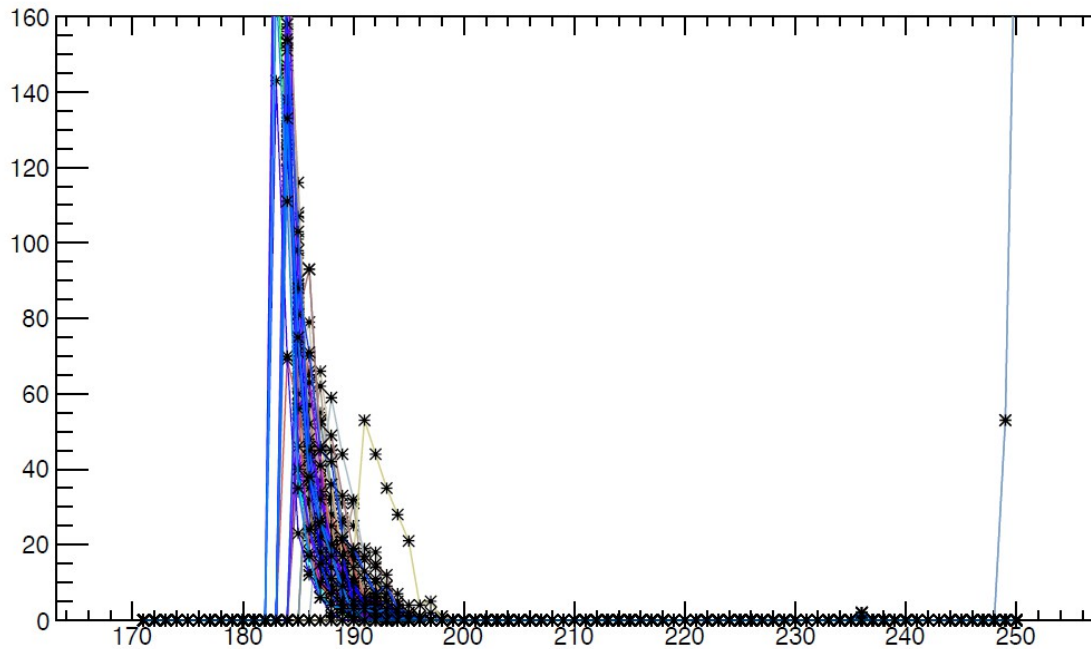


- S-Curves for Chip0 look reasonable up to excellent

- 192 DAC Counts is Common threshold for this ASIC (~1 – 1.5 MIPs)

- Remark: Tests with a better shielded Setup

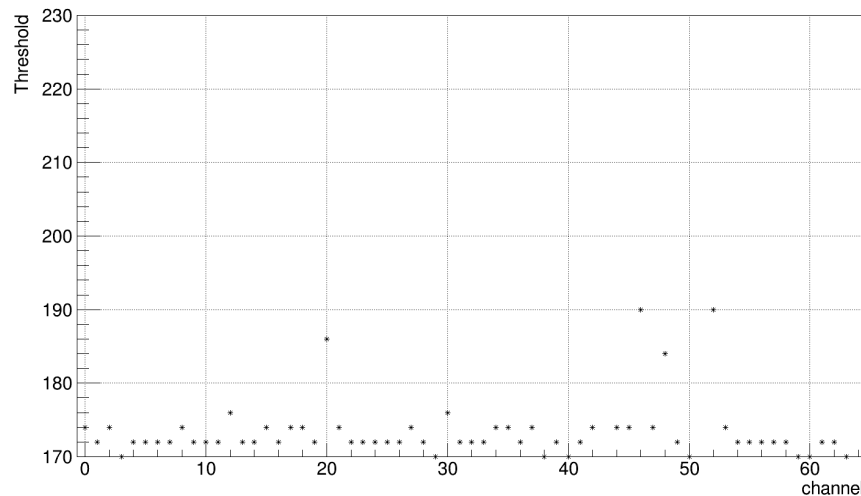
-> 5-10 DAC counts smaller threshold



W/o electrical shielding:

Typical DAC threshold
185 DAC Counts

killed point in Chip7



W/o improved shielding:

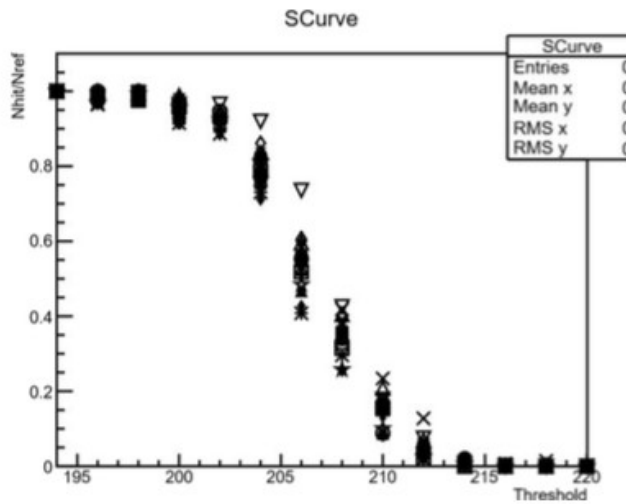
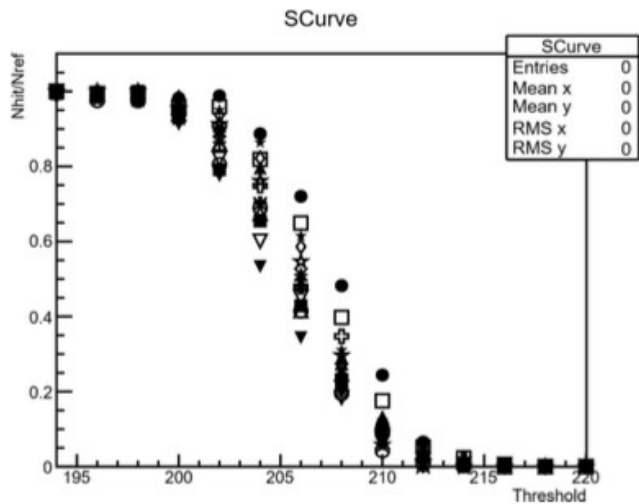
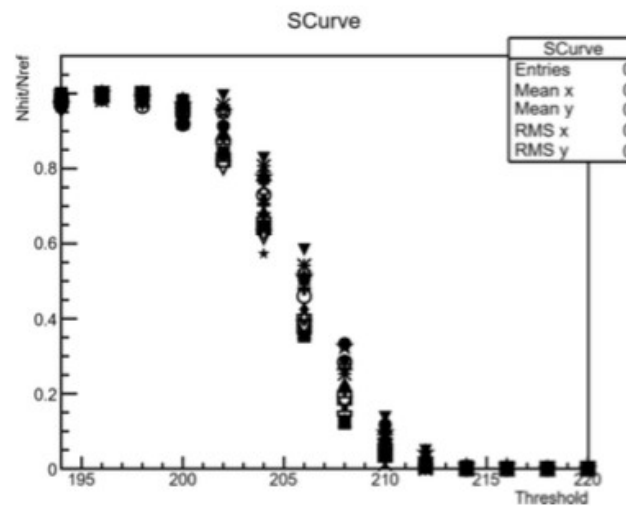
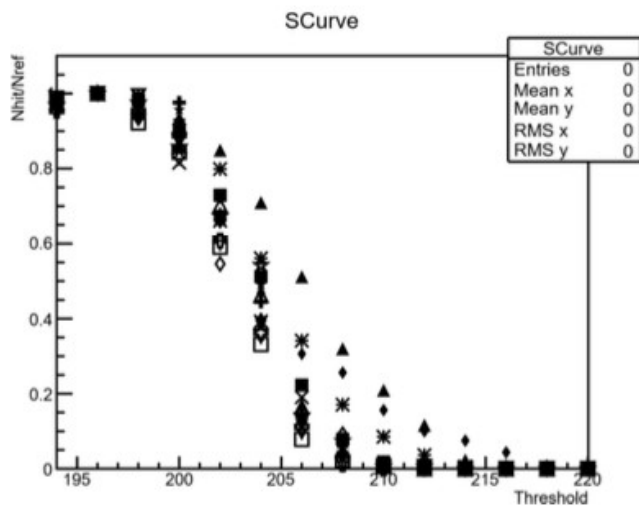
Typical DAC threshold
~170 DAC Counts



- P2IO Project HIGHTEC (France)
 - 25kEUR for thin PCBs and DAQ Setup
- AIDA2020
 - Some money for new DAQ development (new hardware available ~mid-2017)
- PHC Star for travel
 - 16 kEUR (France), 30kEUR (Korea)
- FKPPL for travel
 - Funding to be decided at this FKPPL Meeting

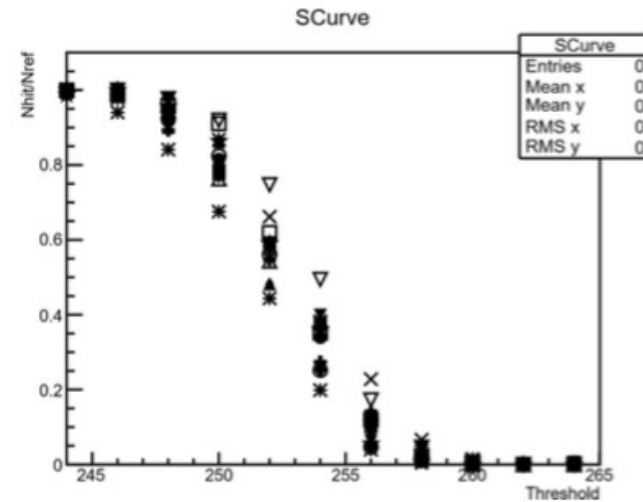
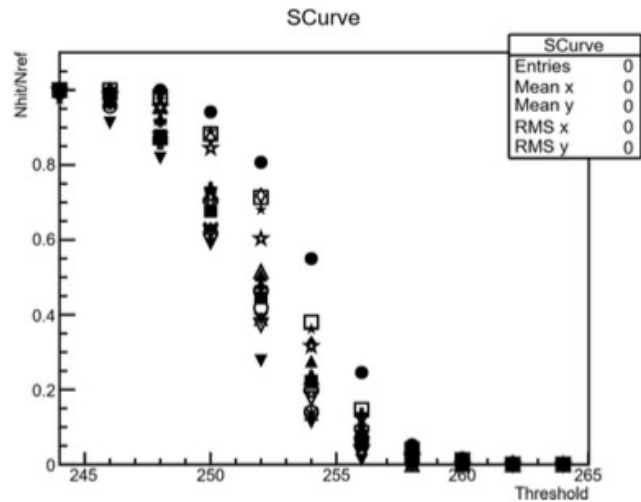
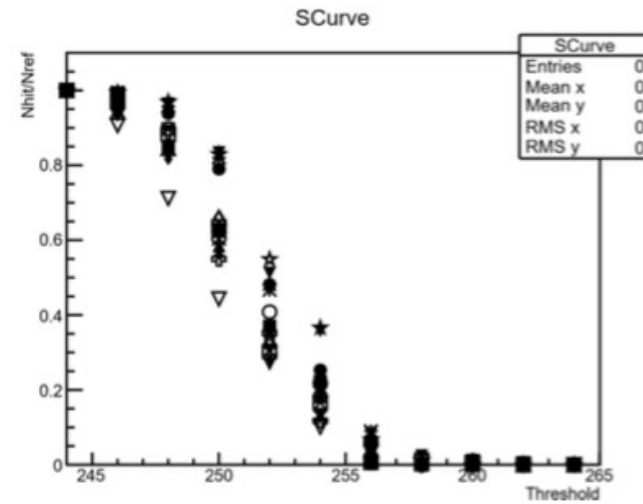
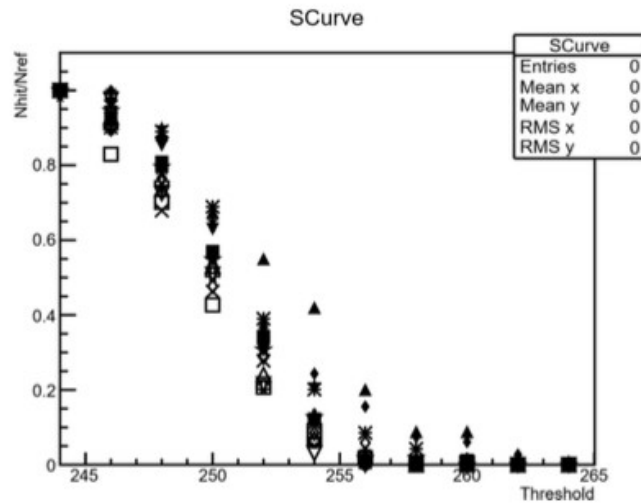


S-Curves ASIC3:
with charge injectio
~2 MIP





S-Curves ASIC3:
with charge injection
~5 MIP



List of excluded cells

	Channels	Test
ASIC 0	11, 17, 30, 52, 63	High Threshold Trigger
	44, 51, 55, 57	S-curves without Signal Injection*
	47	10 MIP Signal Injection
ASIC 1	30, 38	High Threshold Trigger
	22, 27	S-curves without Signal Injection*
	48	10 MIP Signal Injection
ASIC 2	30, 38	High Threshold Trigger
	21, 27	S-curves without Signal Injection*
	48	10 MIP Signal Injection
ASIC 3	0, 4, 45, 56	High Threshold Trigger
	2, 7, 11, 13, 20, 63	S-curves without Signal Injection*
	47	10 MIP Signal Injection
ASIC 4	7, 18	High Threshold Trigger
	9, 13, 17, 28, 30, 36, 61	S-curves without Signal Injection*
	48, 50	10 MIP Signal Injection
ASIC 5	26, 30	High Threshold Trigger
	53	S-curves without Signal Injection*
	47	10 MIP Signal Injection
ASIC 6	26, 30	High Threshold Trigger
	7, 8, 9, 10, 13, 14, 35	S-curves without Signal Injection*
	47	10 MIP Signal Injection
ASIC 7	46, 52	High Threshold Trigger
	20, 24, 33, 37, 38, 42, 44, 48	S-curves without Signal Injection*
	51**	10 MIP Signal Injection