

Update on lifetime measurements



**FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG**

Alexander Britting, Wolfgang Eyrich, Albert Lehmann, Fred Uhlig

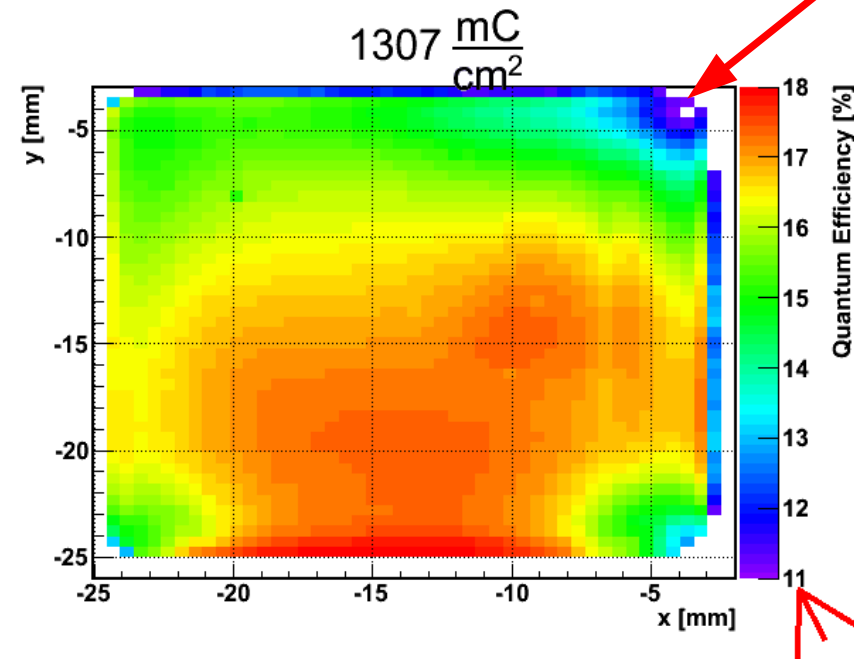
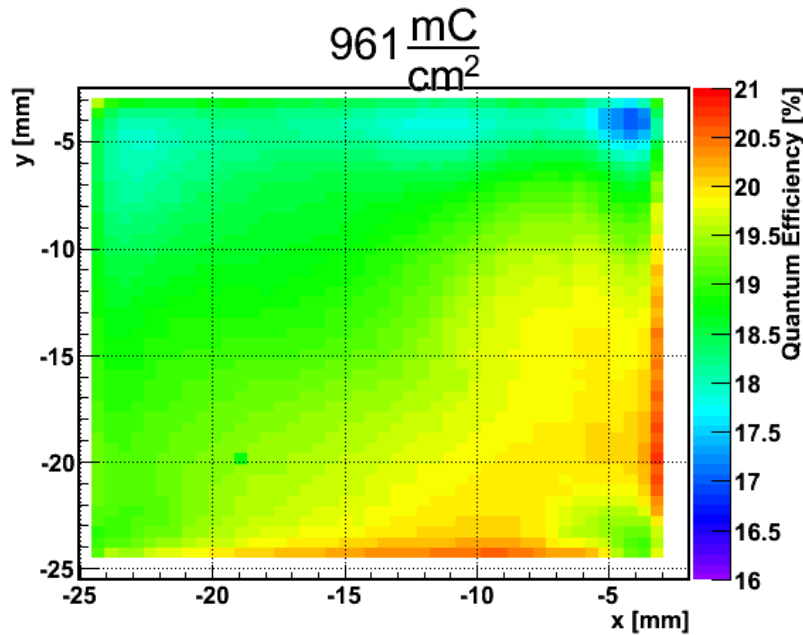
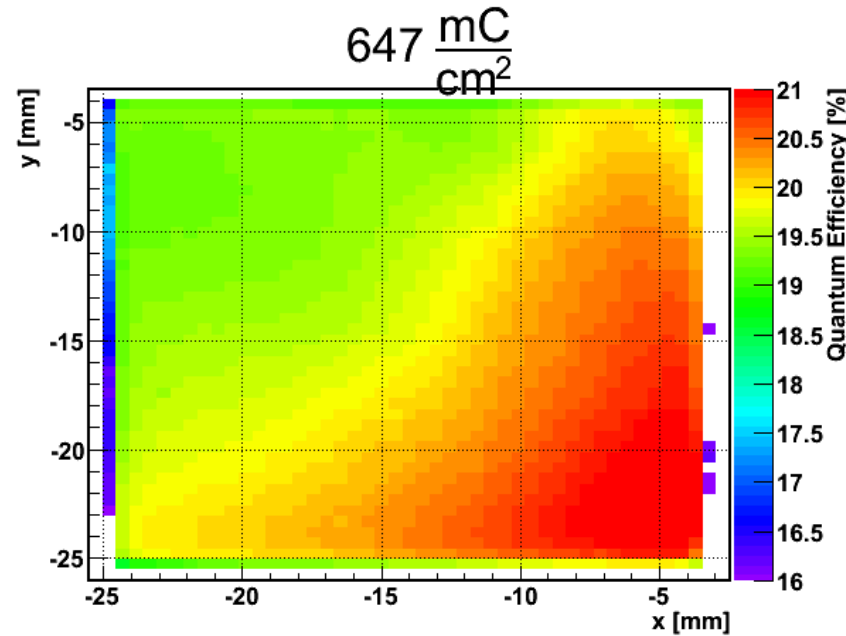
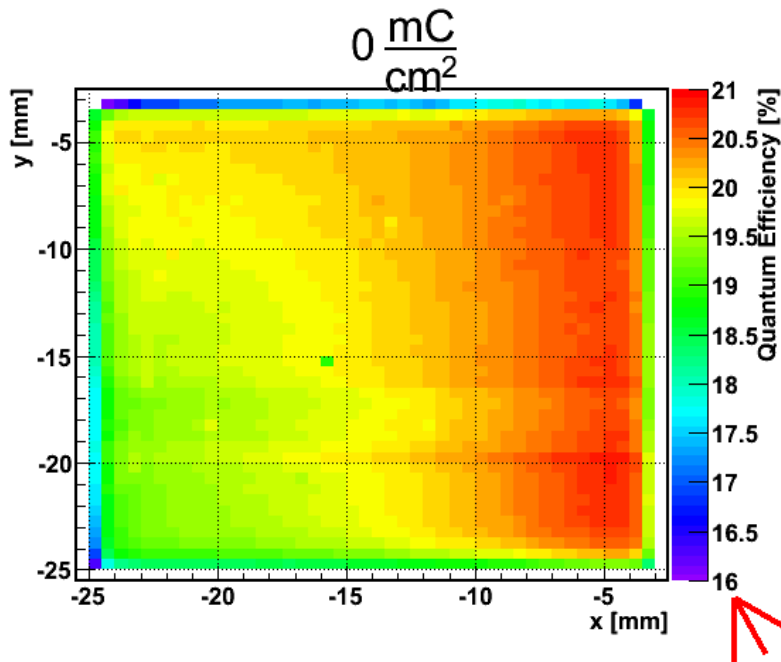
supported by BMBF and GSI

Overview



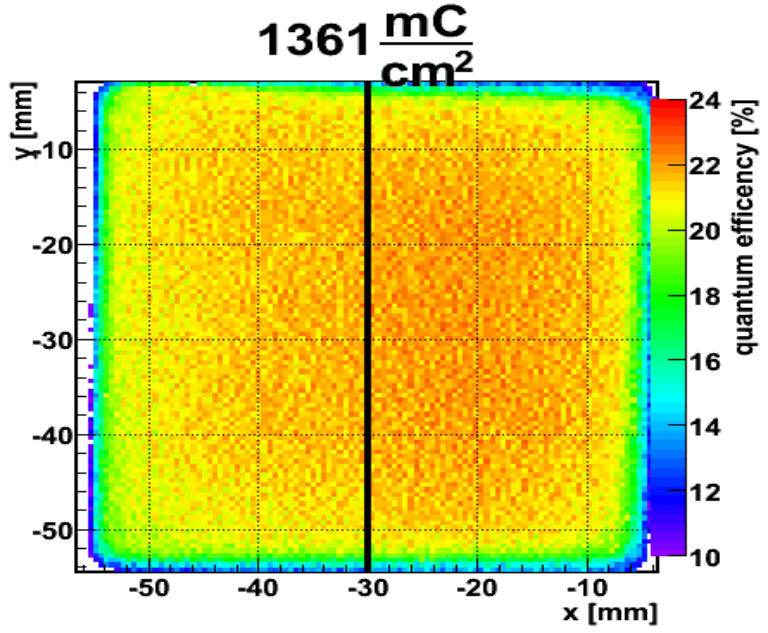
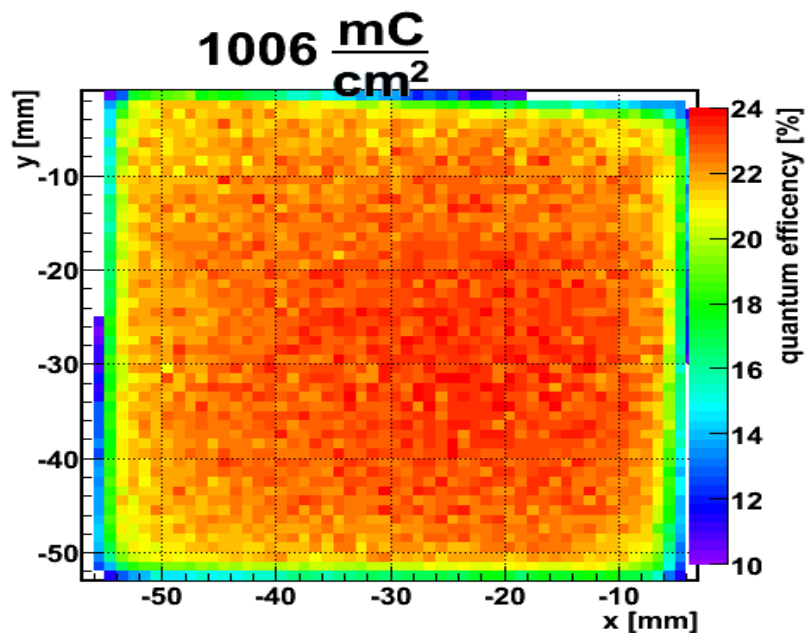
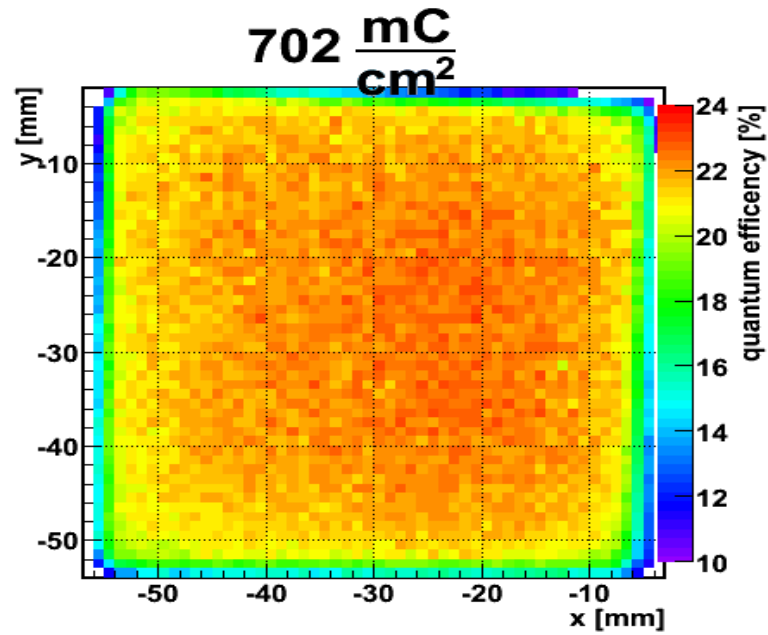
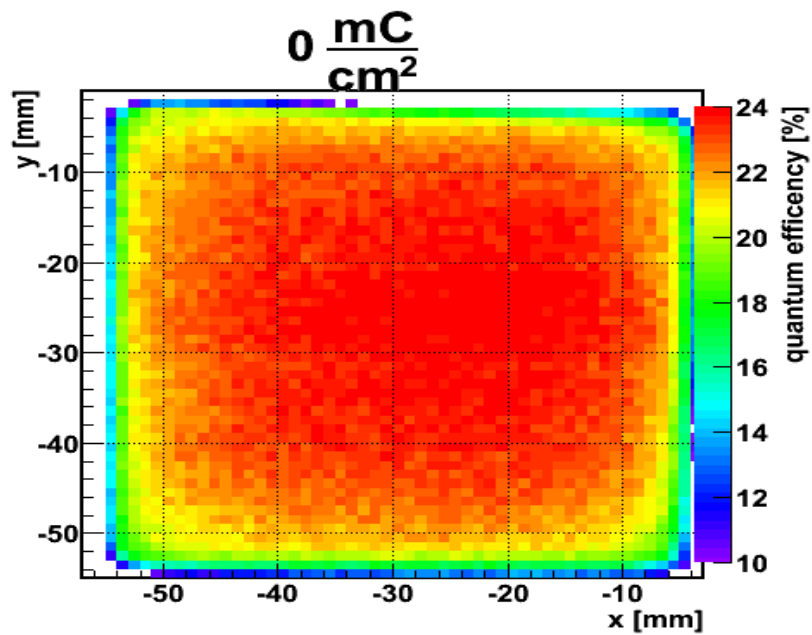
- Results of the latest measurements:
 - QE surface scans
 - Gain measurements
 - QE measurements
- First results of after pulse measurement
- Summary and outlook

QE-Scan (M16)



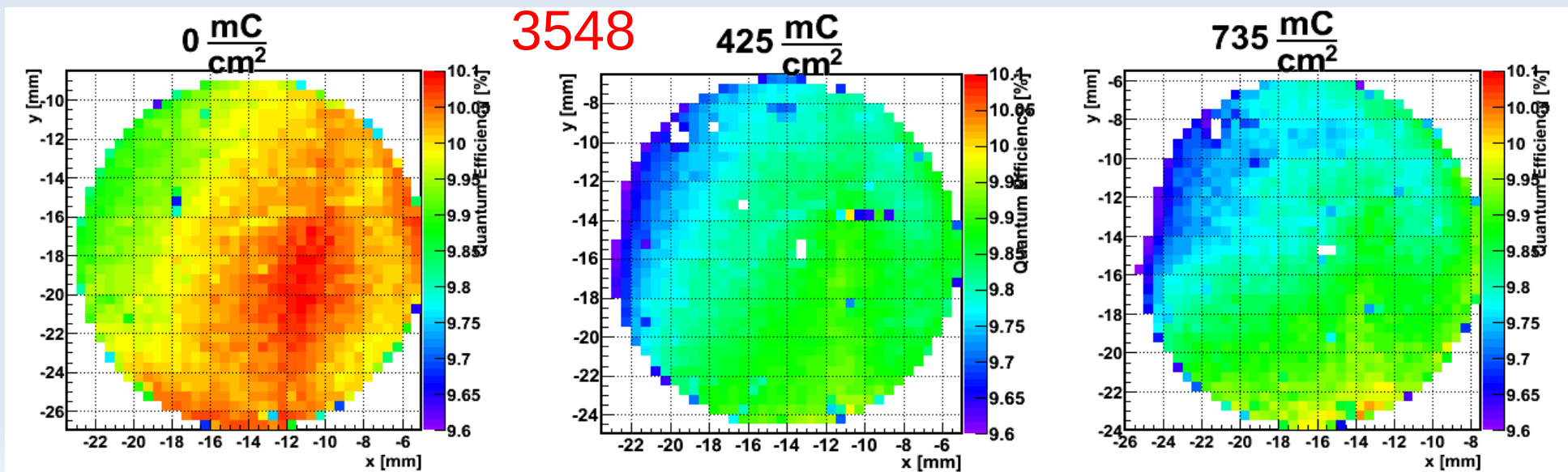
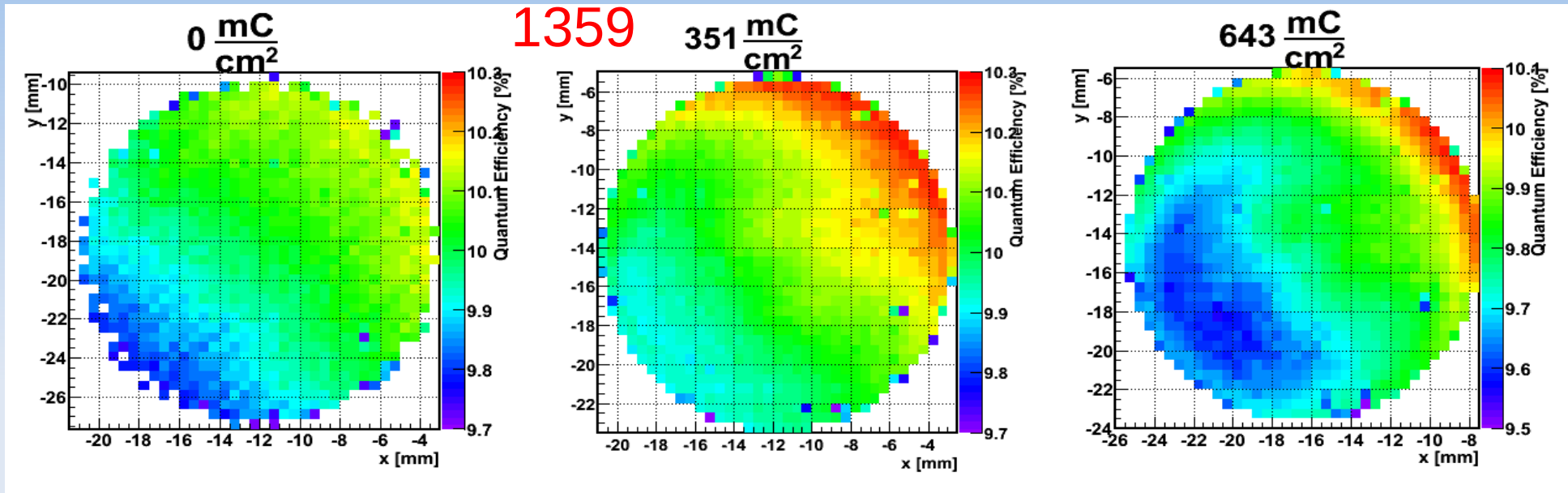
QE drops drastically higher in the corners

QE-Scan (XP85112)



- No 'corner' effects obvious
- Small deviation between illuminated and covered area

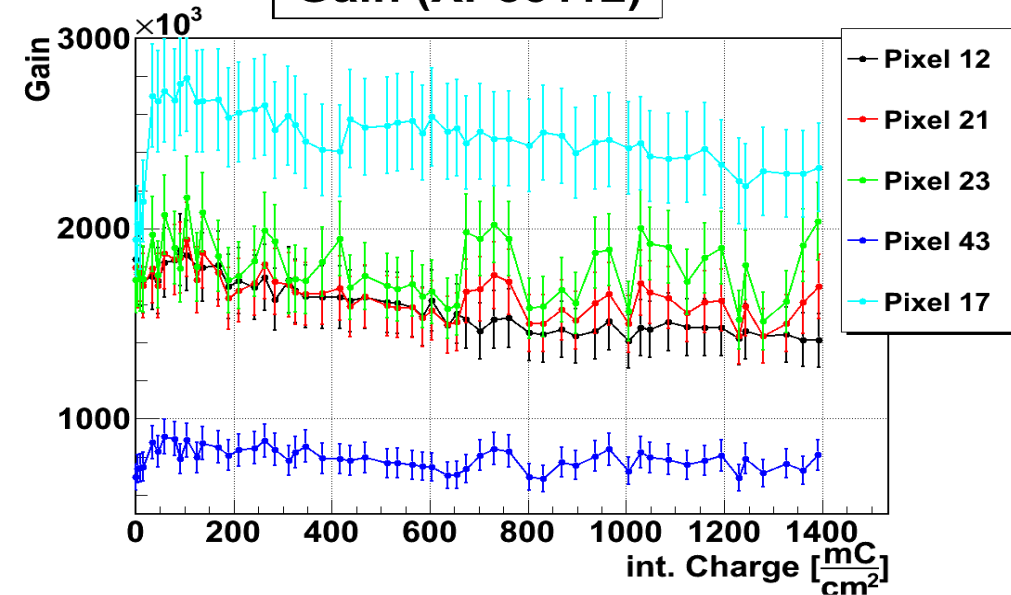
QE-Scan (BINPs)



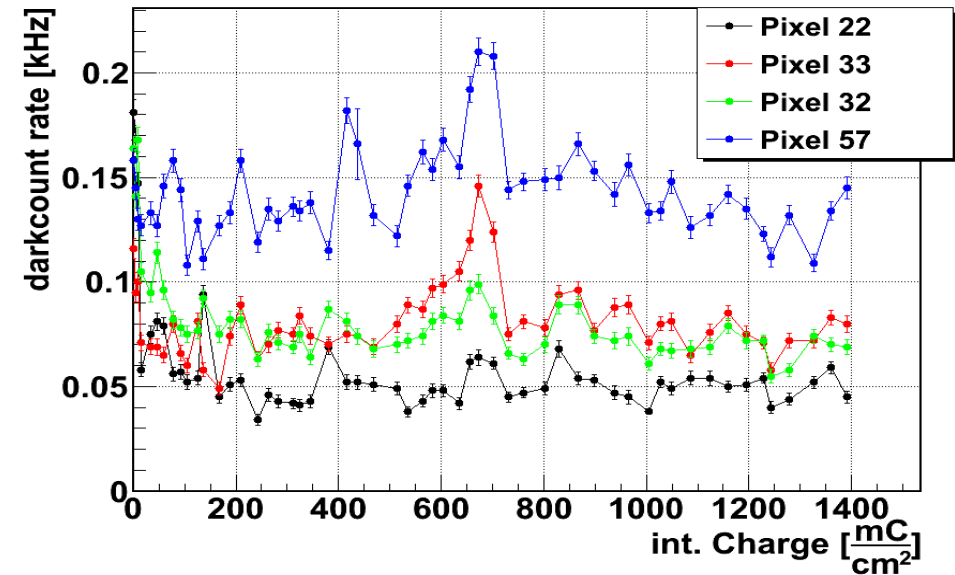
Phot. XP 85112



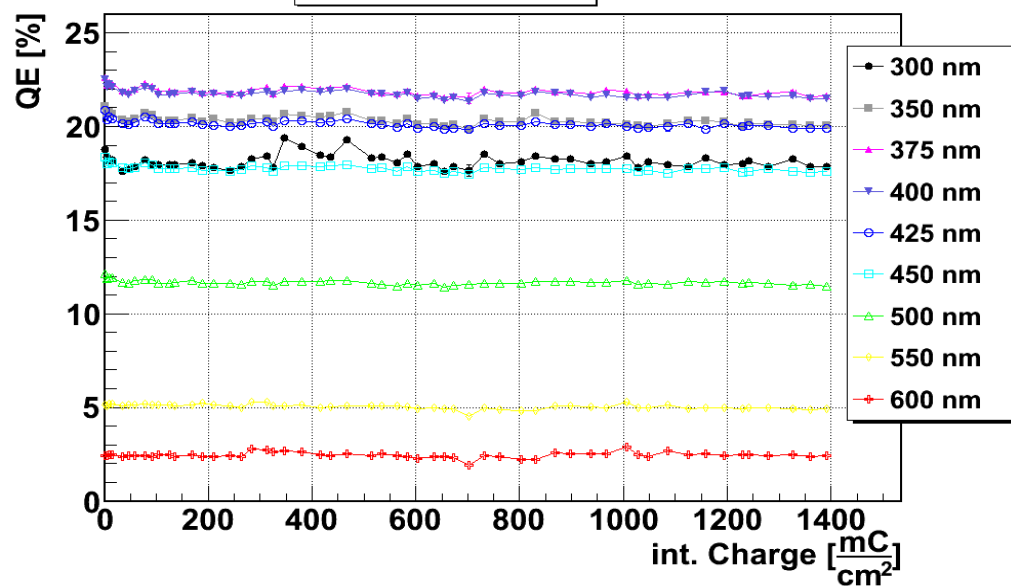
Gain (XP85112)



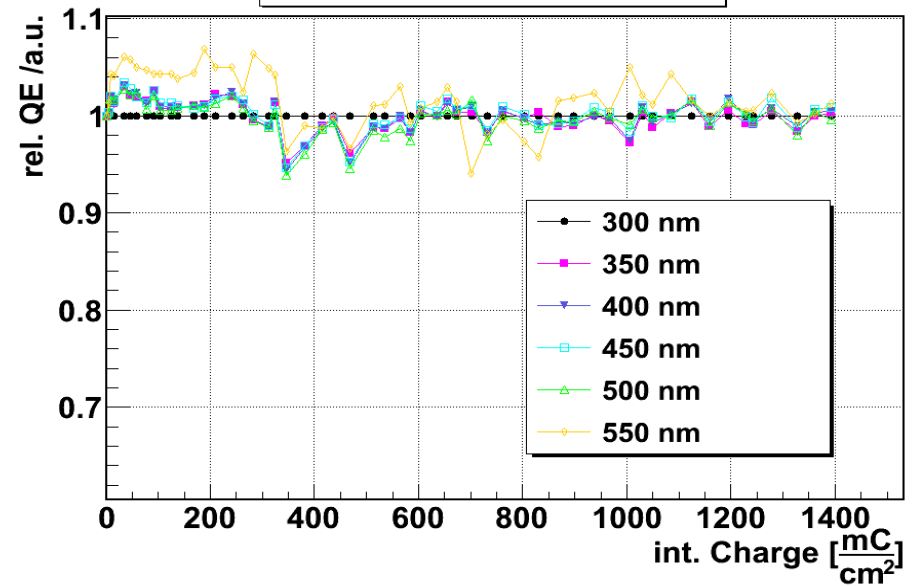
darkcount rate (XP85112)



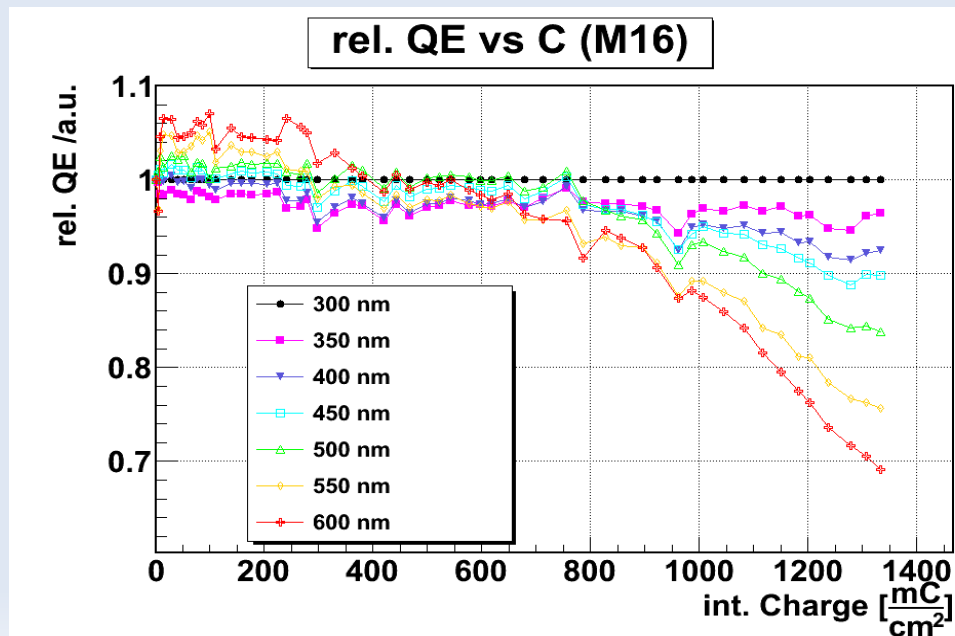
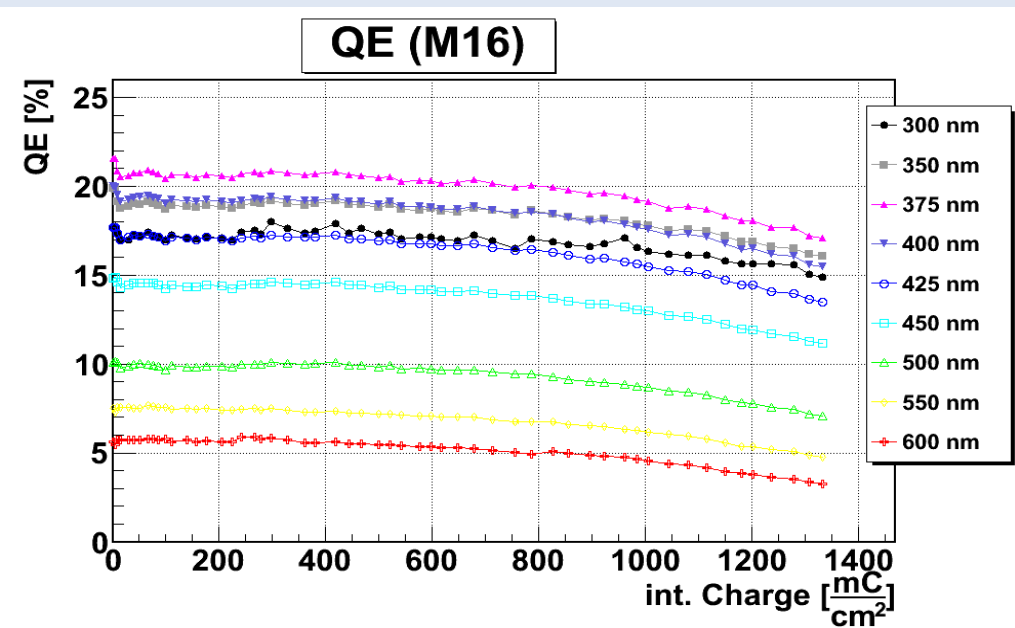
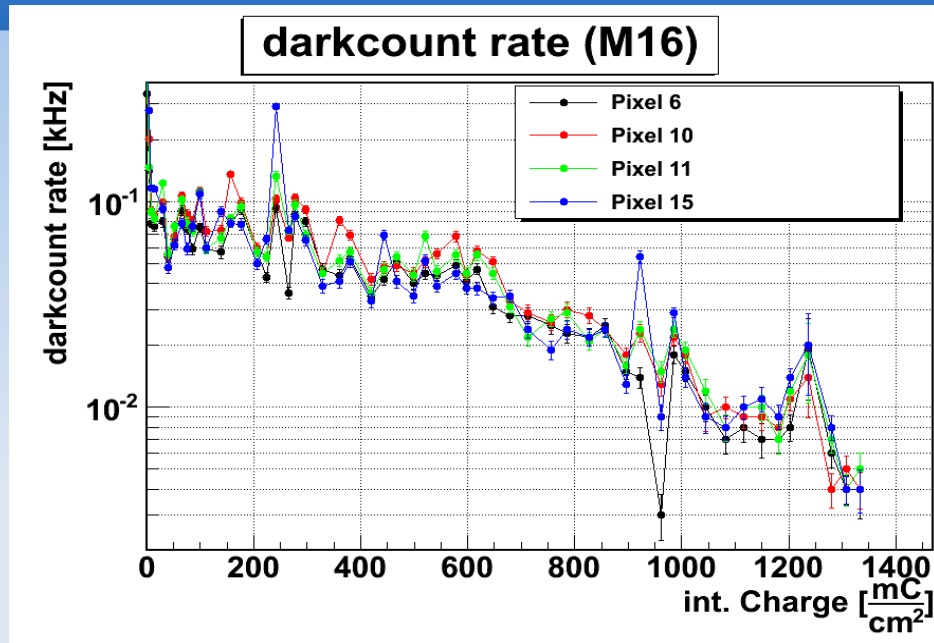
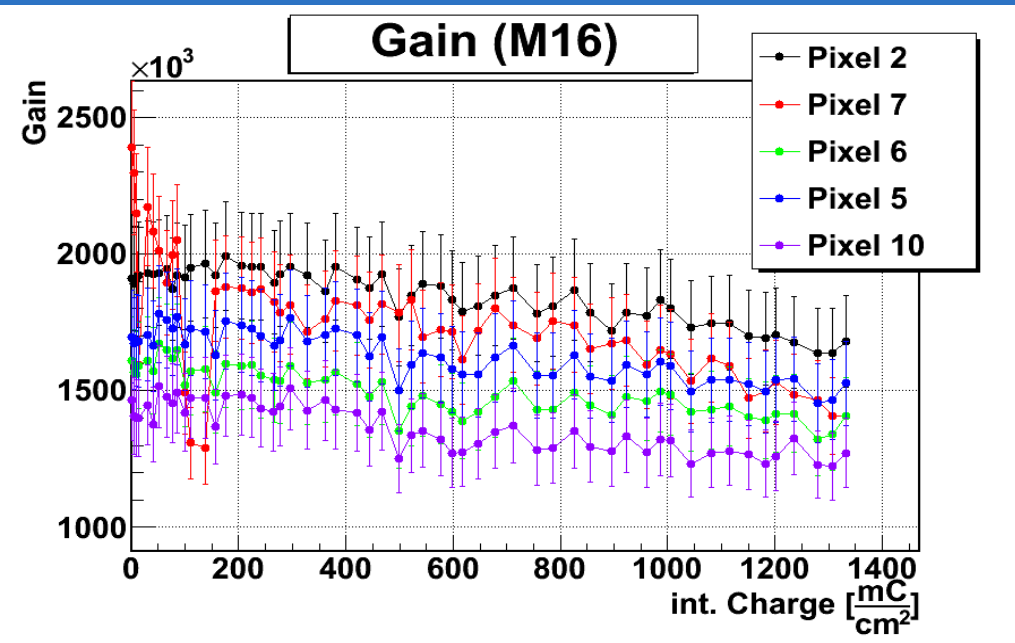
QE (XP85112)



rel. QE vs C (XP85112)



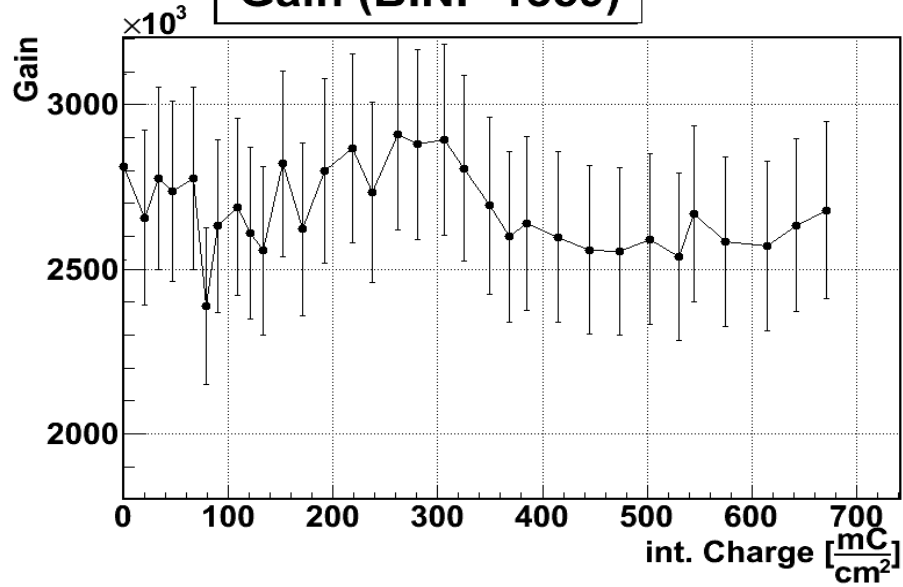
Ham. R10754X-01-M16



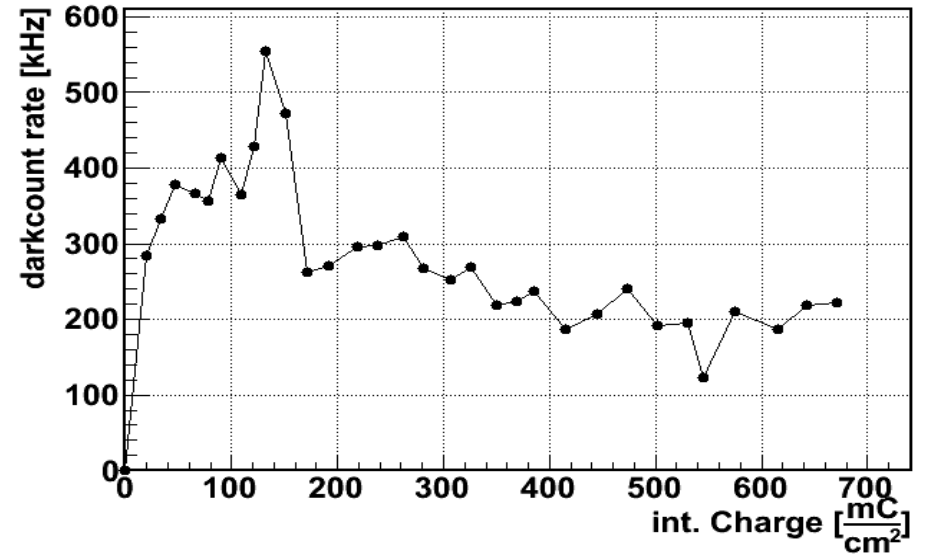
BINP 1359



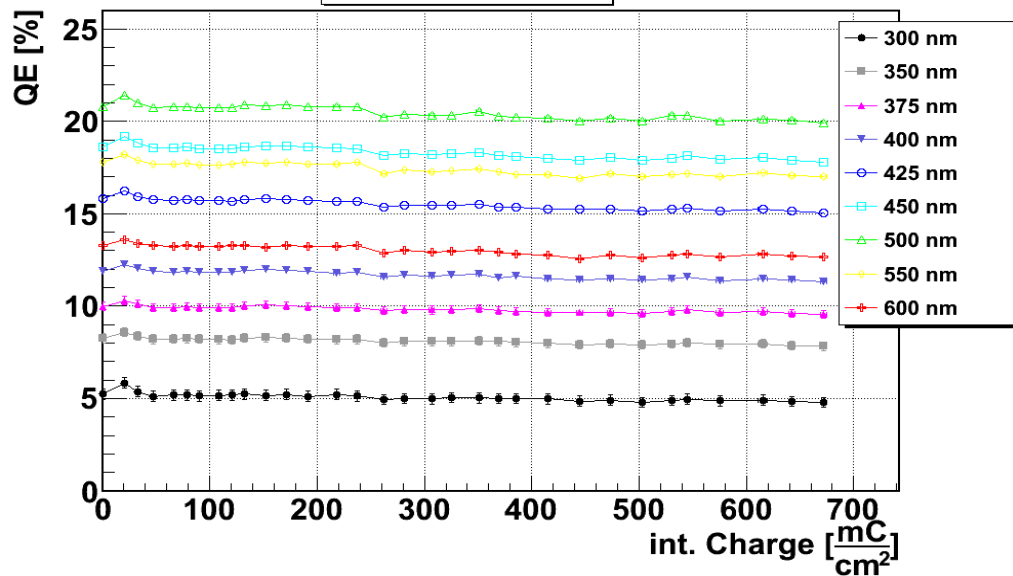
Gain (BINP 1359)



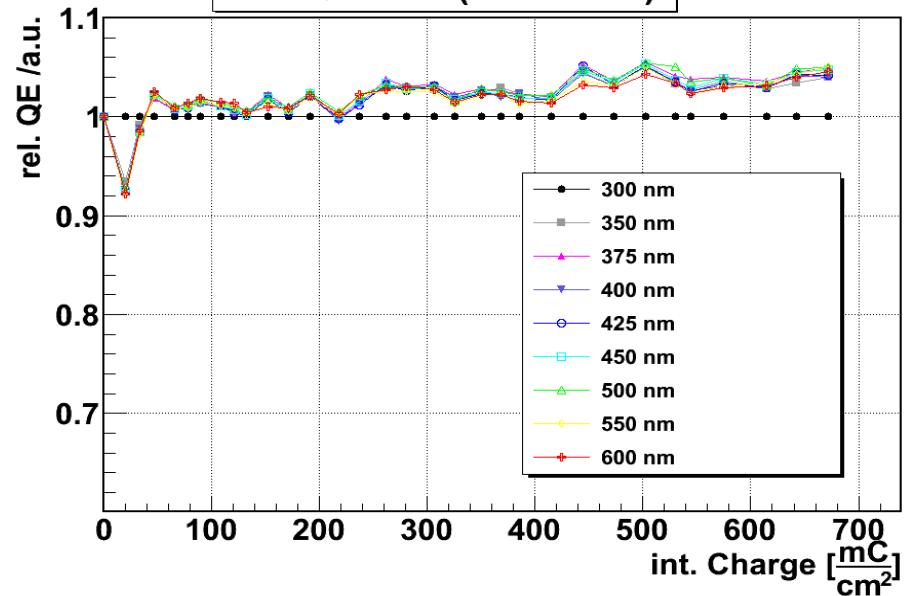
Darkcount rate (BINP 1359)



QE (BINP 1359)



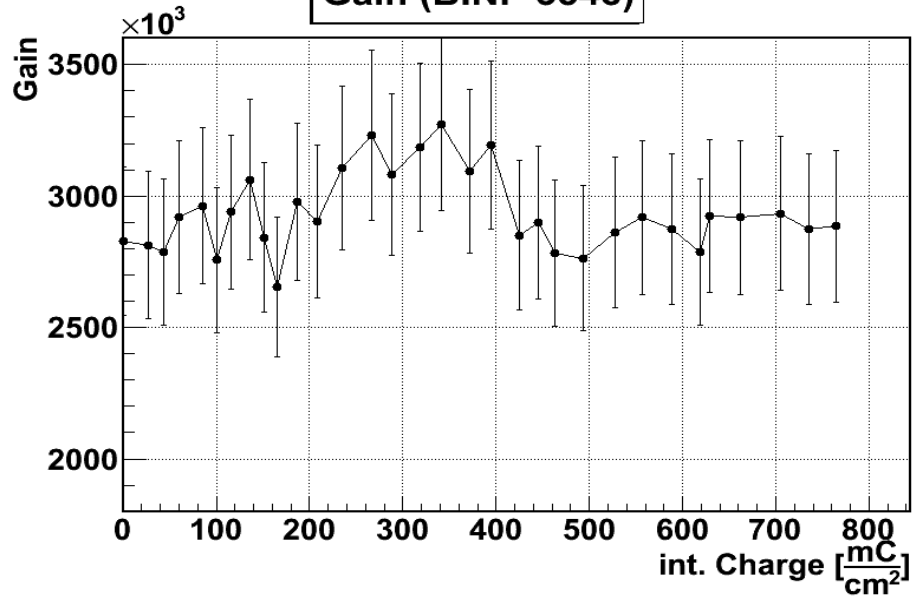
rel. QE vs C (BINP1359)



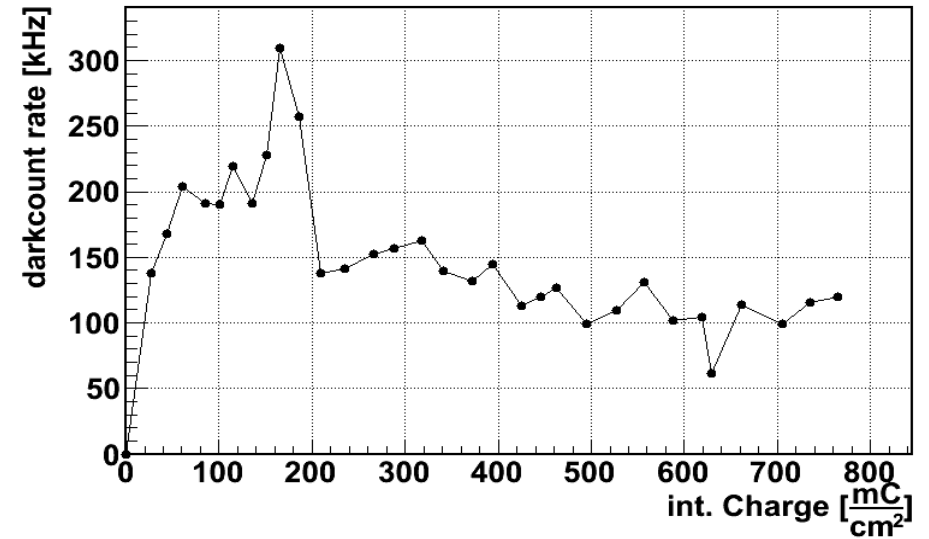
BINP 3548



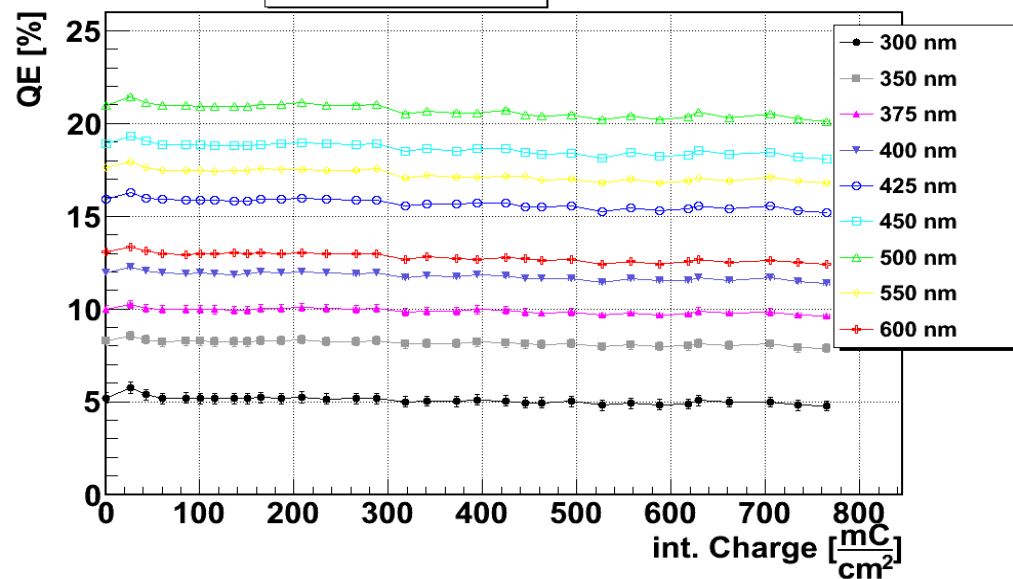
Gain (BINP 3548)



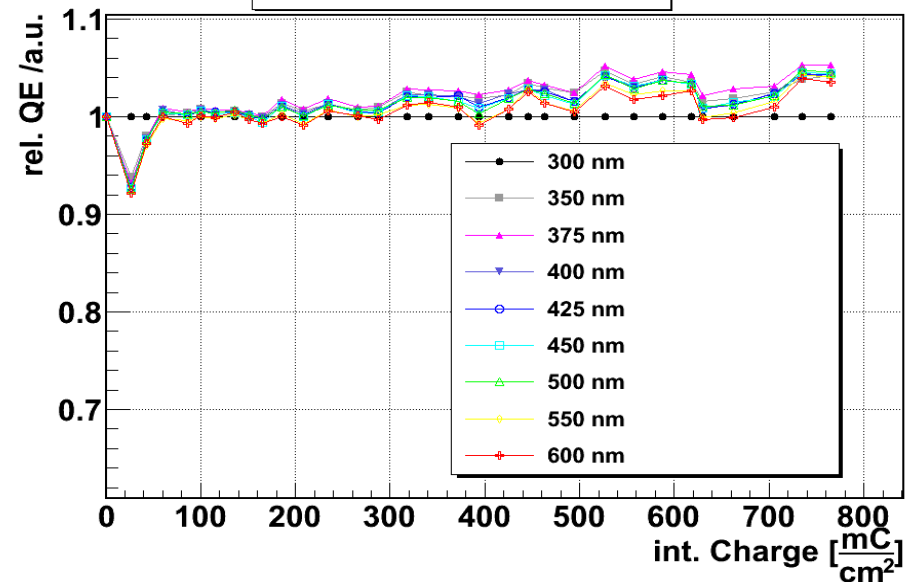
darkcount rate (BINP 3548)



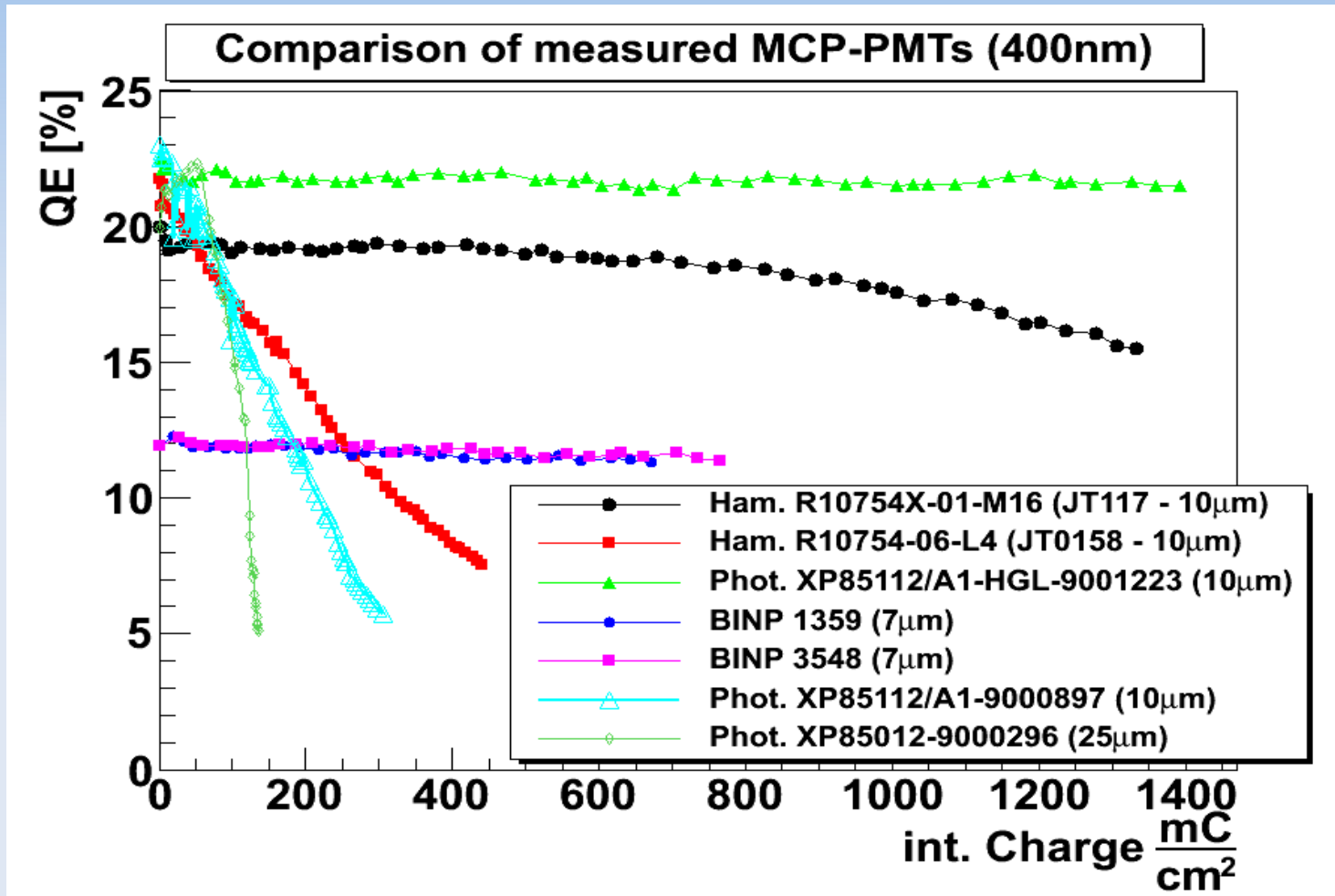
QE (BINP 3548)



rel. QE vs C (BINP3548)

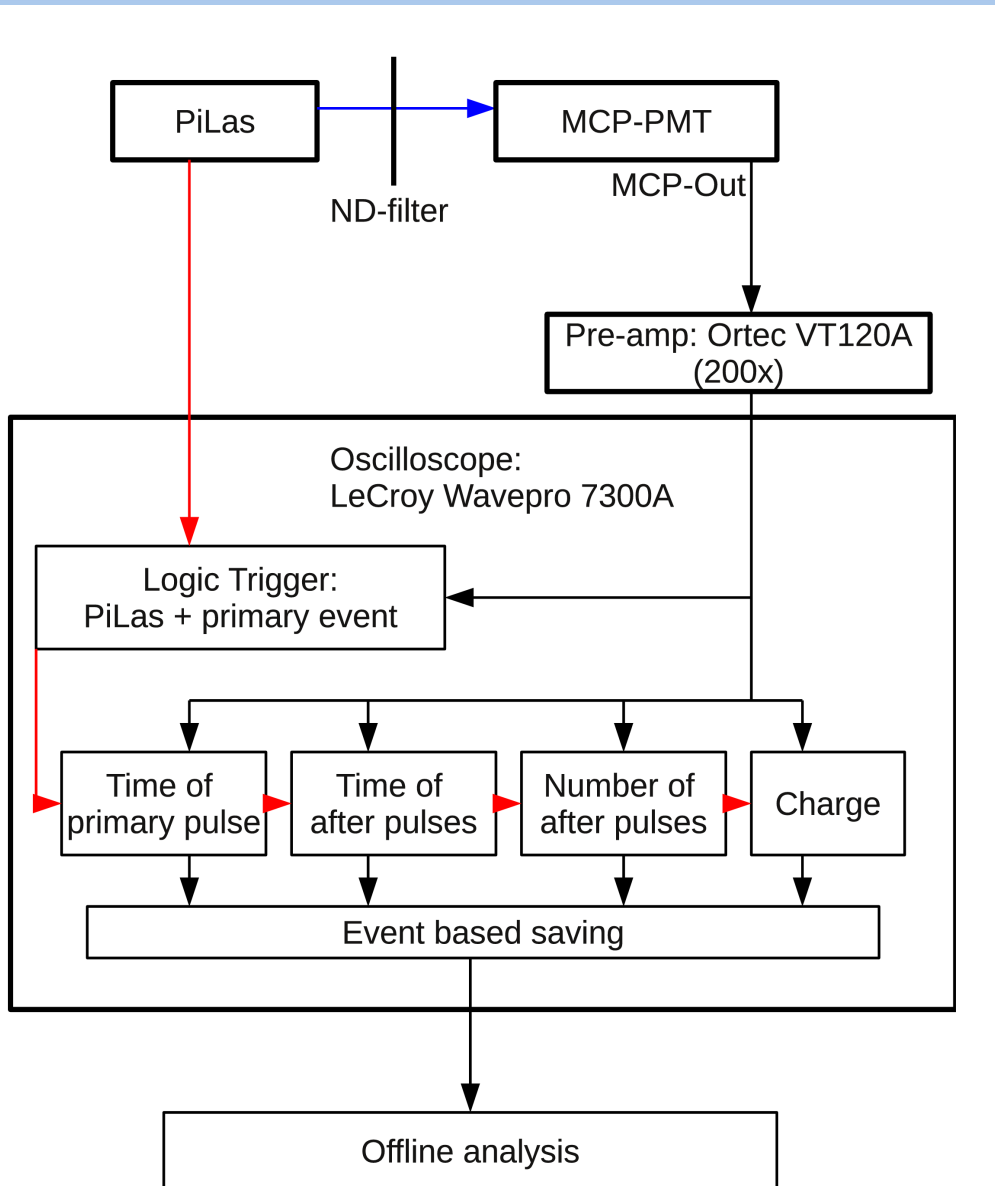


Comparison with older measurements



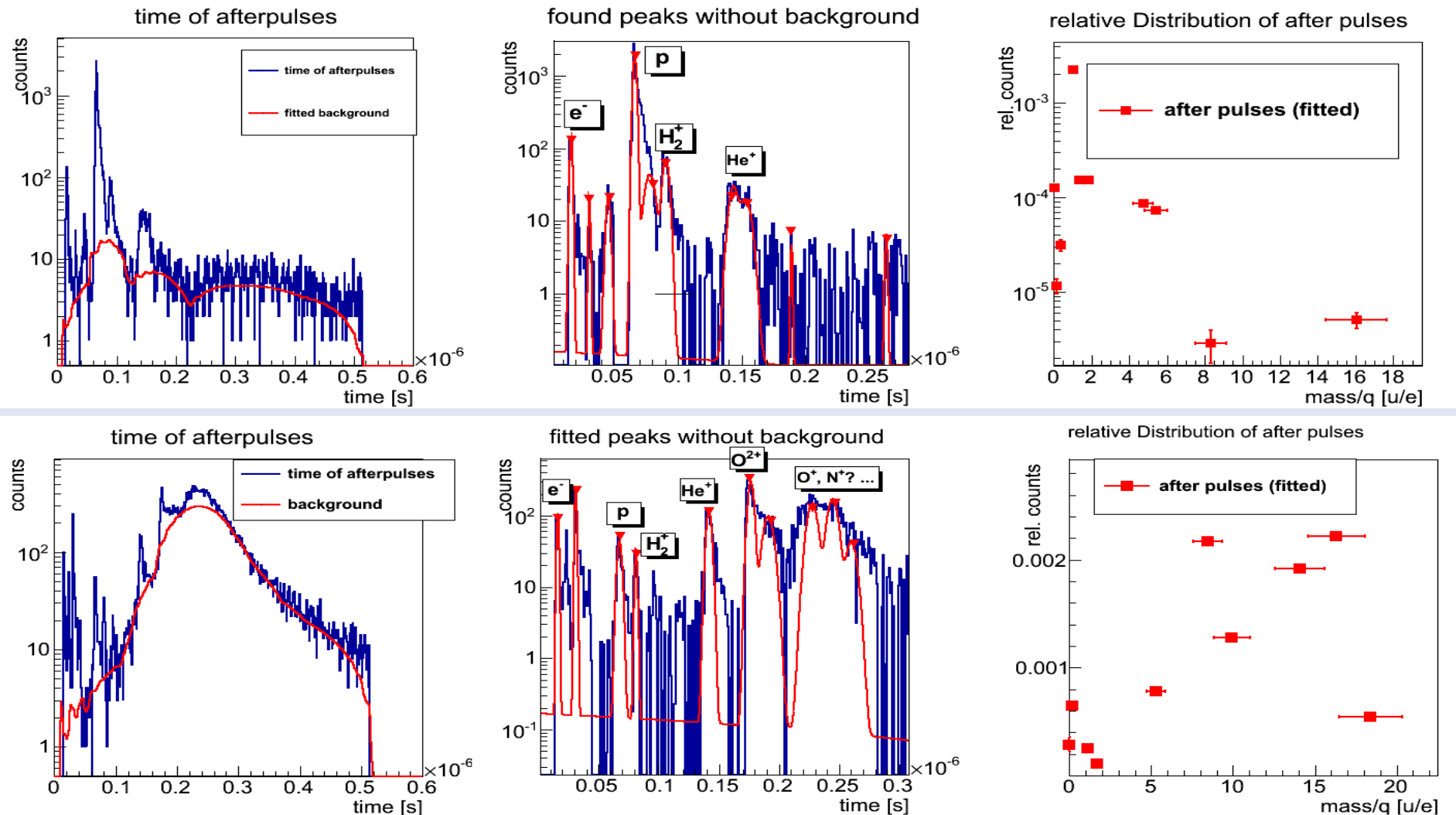
- Up to now, almost no degradation for the latest XP85112
- Aging of M16 accelerates
- BINPs: moderate degradation

After pulse



- Goal: Determine mass/kind of backscattered ions and estimate their amount
- Absolute time can be calculated by time difference of prim. and after pulse
- Classical approach for estimating m/q

After pulse (2)



Phot. XP
85112 -
9001223

Phot. XP
85012 -
9000413

Conclusion: "Older" MCPs are more damaged due to the impact of heavier ions.
=> Degradation accelerates

Summary and Outlook



- Lifetime measurements ongoing:
 - Degradation of M16 accelerates and corners are damaged even more (1350mC/cm²)
 - XP85112 – 9001223: Still stable up 1400mC/cm², although a small – but insignificant – QE-edge between illuminated and covered area is measureable
 - BINPs: slow, but constant, decrease of the QE (680mC/cm² and 780mC/cm²)
- After pulse measurement has to be improved, but different ions can be detected