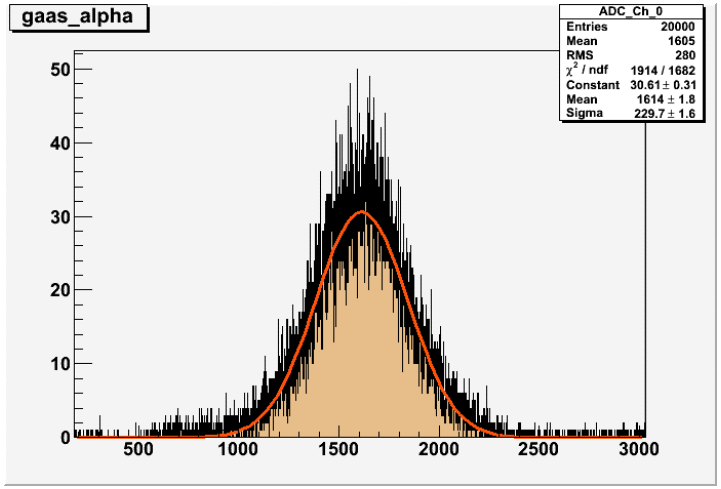
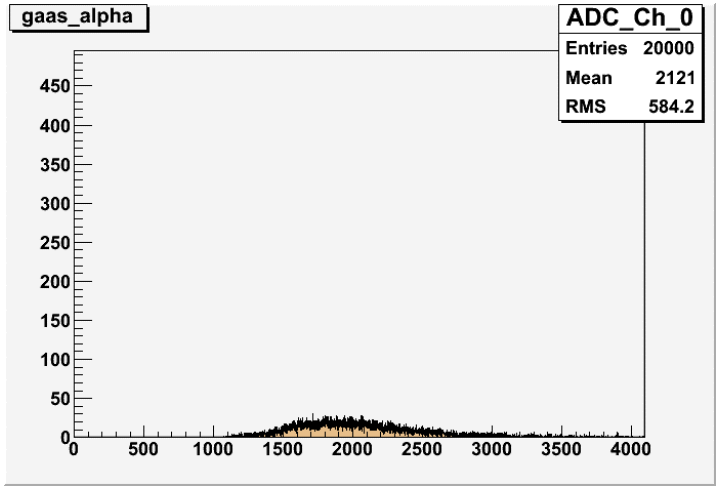
GaAs sensor, irradiation with Am alpha source



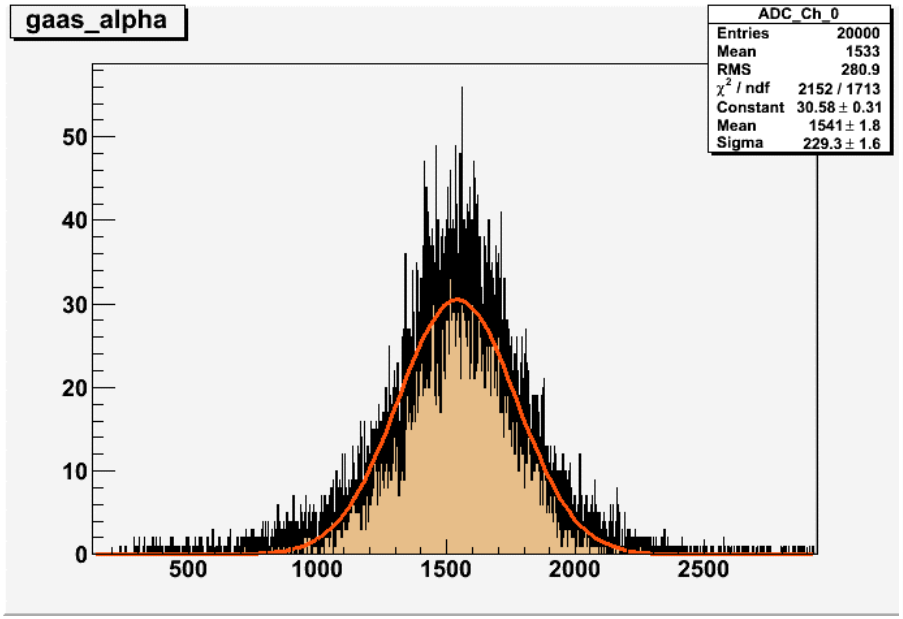


Self trigger

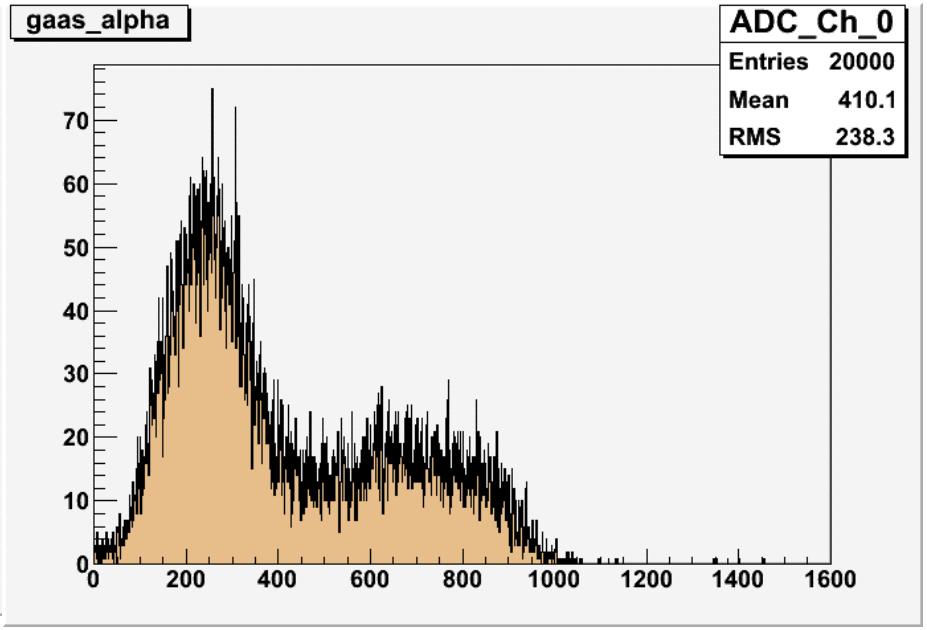
-50 v bias on the same side as Am source
20 dB attenuation

+50 v bias on the same side as Am source
0 dB attenuation

Am source, other side



+50 v bias on the opposite side to Am source
20 dB attenuation



-50 v bias on the opposite side to Am source
0 dB attenuation

Discussion

Both sides show that signal due to electron transport is ~ 10 times larger then to hole transport

This is explained in the paper G.I. Ayzenshtat et al.
GaAs resistor structures for X-ray imaging detectors
Nucl. Instr. and Meth. A 487 (2002) 96.

The explanation is that hole lifetime is much shorter that electron for this type of material (Cr - compensated semi-insulating GaAs)

Conclusions

Both pedestal and signal peaks are shifted. So if we use a fixed pedestal value in our calculations, we could introduce a small systematic error in the order of 1% (5% at highest occupancy).

Pedestal values from the spectra fits could be safely used

At higher occupancies the pedestal width is also increased

I didn't see any correlation between CR and landau and gauss sigma in the fits