# Manifestation of Aging Effects in Gas Proportional Counters

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The influence of aging on energy resolution, length of energy resolution plateau, decrease of gas gain and on the so-called count rate effect has been measured. Special attention has been paid to the performance of aged counters under high gas gain and high count rate. Longitudinal and azimuthal distributions of anode deformation were also determined.

**Summary of Poster:** The aged counters were filled with Ar/isopentane and $Ar/CO_2/N_2$/isopentane mixtures. Isopentane was selected as an additive to accelerate the aging at normally encountered anode current. The detectors were exposed to radiation coming from $^{109}$Cd and $^{90}$Sr sources. The aging currents were: 20nA, 85nA and 1000nA, respectively. Results:

- strong degradation of energy resolution and shortening of energy resolution plateau were observed; the effect is much stronger for higher gas gain and higher intensity of measured radiation,
- the decrease in gas gain is a linear function of collected charge; for fixed collected charge it is a linear function of applied high voltage,
- the count rate effect strongly depends on collected charge; for fixed collected charge it depends on the applied high voltage, i.e. for low gas gain and low intensity of radiation a good spectrum for $^{55}$Fe is observed, whereas for high gas gain and high count rate a double-peak structure is observed.

It should be underlined that all aging tests were done at normally encountered anode current. The main scope of this work was to determine which parameter of the detector is most sensitive to aging.