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Operation of proportional counters under high gas gain, high working gas pressure in mixed field of radiation.

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Gas gain is one of the main parameter of proportional counter. It was measured that this value depends on type of detected radiation and for beta particle is higher by (6-8)% than for X-rays.
Over some value of current flowing threw the counter (Ic-critical current) the reduction in gas gain due to space charge defined by the time of evacuation of positive ions is observed. The value of Ic for different counter geometry and different mixture pressure was measured. It limits the rate capability of the detectors.
Above some value of gas gain (Ac - critical value of gas gain) non-proportionality due to self inducted space charge effect is observed, avalanche size exceeds Reather's limit. The value of Ac was measured as function of working gas pressure for different counter geometry.
The stable performance of proportional counters uned high gas gain and high working gas preasure is very crucial for detectors working at harsh condition of LHC.
Results of systematic measurements of above values will be presented.

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