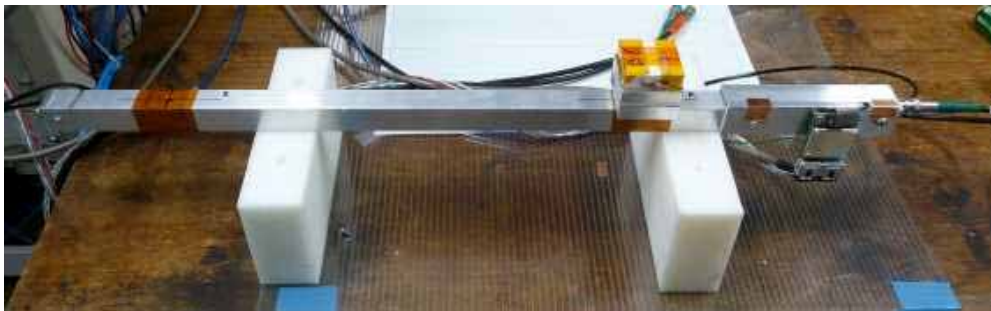
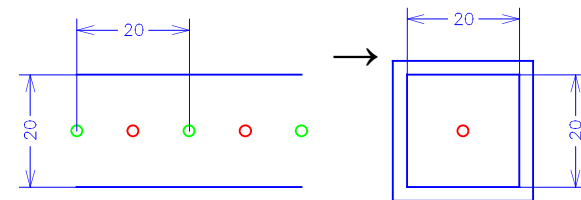


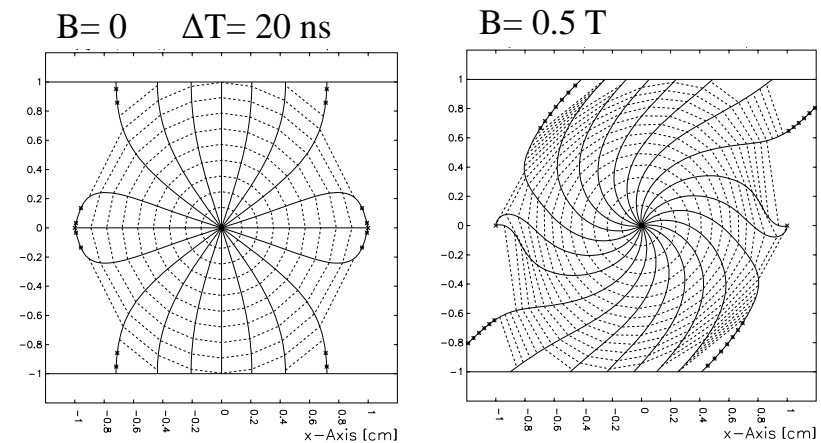
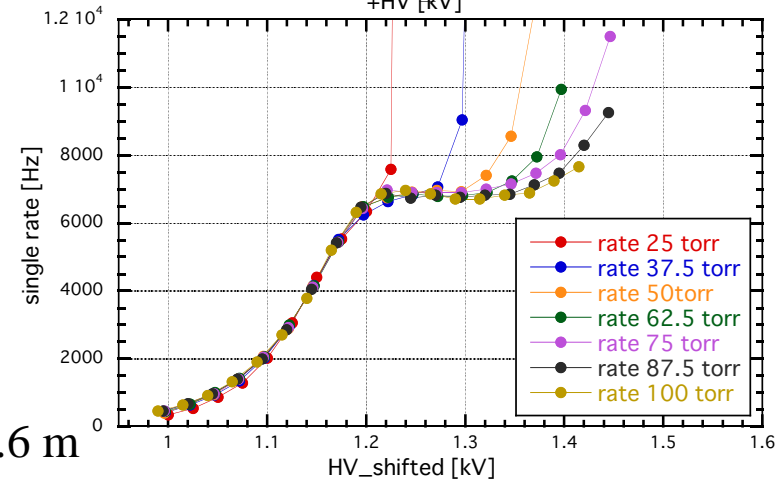
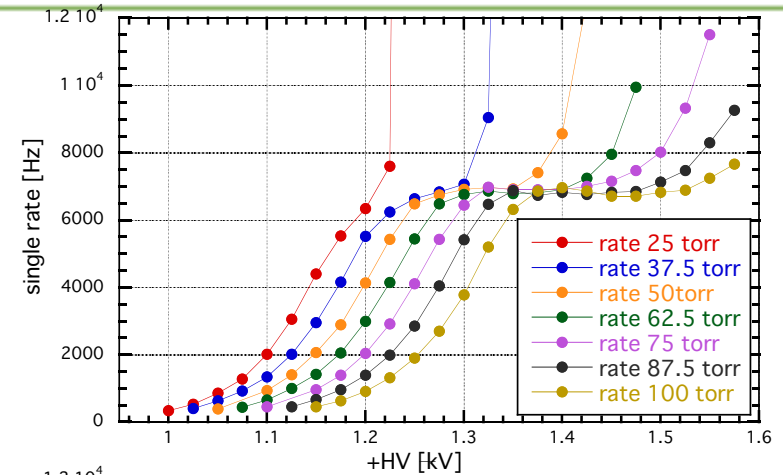
MDC memo -1

- MDC prototype for operating conditions
- Bench test
- Preliminary design

- Position detector in the magnetic field & vacuum for protons
 - cathode MWPC ideal, but difficult, in terms of cost, to make a large one
 - alternative: drift chamber
 - cell size : drift distance~ 10mm, with moderate # wires & readout
 - smaller cell size preferred : but no space for ASD(X)
 - gas : i-C₄H₁₀ at low pressure : large load on the gas window
 - pressure, HV?
- Prototype
 - for rough guess on gas pressure & HV
 - similar structure
 - cathode : Al square pipe, ID 20mm x 20mm
 - anode : 20 μ m ϕ Au-W, L= 600 mm
- Test bench



- Test conditions
 - Gas : $i\text{-C}_4\text{H}_{10}$, $P= 25 \sim 100$ torr
 - ASD : $\tau= 80$ nsec, $V_{th}= -0.4$ V
 - +HV(anode) : $1.0 \sim 1.6$ kV
- Single rate for MIP
 - source: ^{90}Sr β rays, collimated
 - plotted with HV shifted : $\Delta\text{HV} \sim 27$ V
 - gas pressure ?
 - if plateau length > 100 V required for stable operation
 - $P= 50$ torr, marginal
 - probably OK for protons
 - $P > 60$ torr OK
 - load on window ~ 500 kgw for $1 \text{ m} \times 0.6 \text{ m}$
 - high voltage ?
 - HV(MIP) ~ 1.35 kV @ ~ 60 torr
 - $\Delta G= 2$ for $\Delta\text{HV}= 45 \sim 50$ V
 - HV(250 MeV proton) ~ 1.3 kV
- Drift time distribution (estimation)
 - $i\text{-C}_4\text{H}_{10}$ 60 torr, HV= 1.35/1.45 kV, B= 0, 0.5 T



- General
 - drift distance & half gap : 10 mm, Walenta type
 - configuration : xx'xx'yy'yy'
 - cathode : 12 um Al-Mylar
 - anode / potential wires : using feedthrough
 - readout : 48 ch/X, 32 ch/Y, total 320 ch
 - effective area : 970 mm (H) x 580 mm (V)
- Current problems : with Chiga-san
 - (vertical effective area is small (580 mm) ; difficult using feedthrough)
 - gas window : ~ 500 kgw load at 60 torr
 - 125 um Kapton + Kevlar (?) or w/o Kevlar
 - simple & cheap gas seal (< 100 torr) or O-ring
 - (reduce weight if possible)
 - (HV insulation, spark)
 - cost

