# Memo
for
exp_samurai_2017spring(S34)
on
^{3}H detection in FDC1 & FDC2

- It is impossible to satisfy the following requirements in S34
  - FDC1 under the conditions : stable operation, $\varepsilon(^3$H$)\sim100\%$, & I(^{8}He)~ 0.25 MHz
  - $\varepsilon(^3$He$)\sim100\%$ in FDC2
- Possible solution
  - not yet tested, but I think it is possible
  - add FDC0 between target & FDC1.
  - additional 229 mm necessary between GV(target) & FDC1

Problems & Proposal

- Requirements & problems for S34
  - ^{3}H detection in FDC1 together with 0.25 MHz ^{8}He beam
    - stable operation nor $\varepsilon(^3$H$)\sim100\%$ impossible in FDC1
    - ∵ FDC1 : drift distance= 5 mm, half gap= 5 mm, P(i-C$_4$H$_{10}$)= 50 torr
  - ^{3}H detection in FDC2 (^{8}He is off FDC2)
    - $\varepsilon(^3$H$)\sim100\%$ impossible in FDC2
    - ∵ anode diameter= 40 umφ
- Proposal as a possible solution
  - purpose : satisfy the requirements
    - $\varepsilon(^3$H$)\sim 100\%$
    - (relatively) stable operation @ 0.25 MHz ^{8}He beam
  - add FDC0 between target & FDC1
    - FDC0
      - drift distance= 2.5 mm
      - half gap= 2.5 mm
      - P(i-C$_4$H$_{10}$)= 75~100 torr
      - effective area= 160 x 160 mm^2
      - configuration : xx'yy'xx'yy'
      - material : 8um^t Al-Mylar x 9
      - #readout channels : 256 ch (64ch VME-TDC x 4)
    - need additional 229 mm between GV & FDC1.   see next page

Possible Setup

• Add FDC0 between GV & FDC1 : additional 229 mm necessary
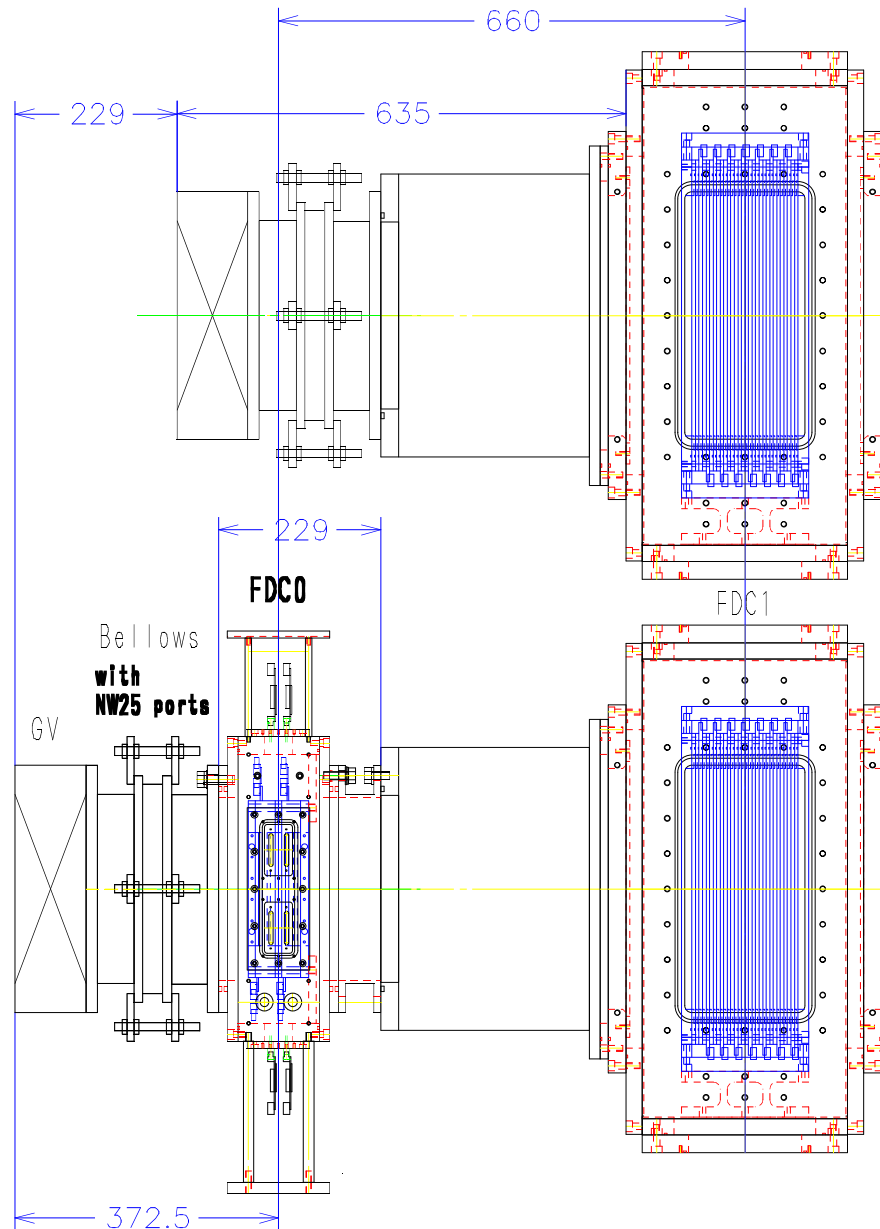
• standard setup

• proposed setup with FDC0
  • additional 229 mm necessary