Memo on Samurai Standard Detectors

BDC spare(s)

- Preparation of BDC spare(s)
  - BDC3 : Y2 still bad, need more work
  - BDC4 : OK , one spare ready
  - spare PCB's being prepared

BDC spare(s)

- Previous memos : history
  - Problems in S13(Jun-2016)
    - memoTK_bdc_20160808.pdf
  - Memo on BDC spare
    - memoTK_bdc_20160826.pdf

- Preparing BDC spare(s)
  - naming
    - BDC1: current BDC1 (in box)
    - BDC2: current BDC2 (in box)
    - BDC3: made in Dec-2010
      - "BDC2+BDC3" → one working BDC2 in Dec-2011
      - Y1 : 3 anode wires, 3 potential wires broken
      - Y2 : large leak current from potential wires. Reason ?
    - BDC4, BDC5 : made in 1997, used in several experiments
  - spare low-pressure box
    - newly made
    - ASD feedthrough flanges
  - spare PCB's for BDC
    - being prepared : 10 PCB's

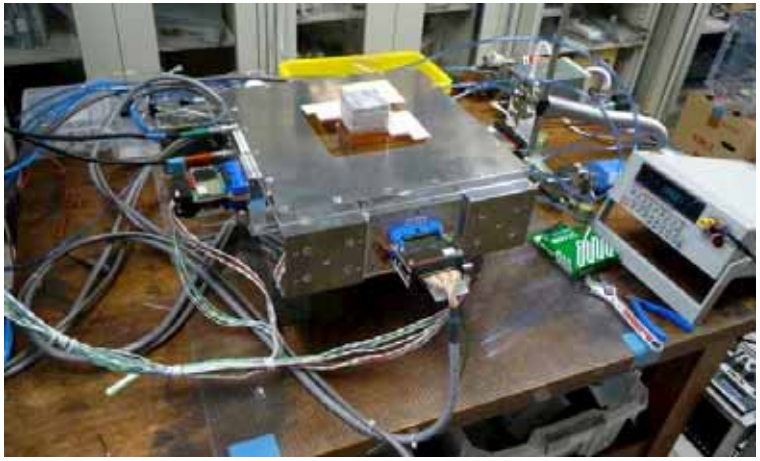
BDC3 -1

- Repair of bad planes
  - Y1
    - wires, solder, glues : removed & cleaned [23-Aug ~ 26-Aug]
    - wires (3 anodes, 3 potentials) fixed [29-Aug ~ 5-Sep]
  - Y2
    - ultrasonic cleaning in alcohol

- HV test & conditioning @atmospheric pressure
  - P10 : < 10 nA @1.05 kV [~7-Sep]
    - all planes OK including Y1 & Y2
  - i-C_4H_{10} : HV <1.7 kV [~13-Sep]
    - OK
    - no large DC leakage current in Y2 : surface leak reduced
    - Hit pattern is continuous in Y1 : 3 repaired anode wires : OK
    - i-C_4H_{10} run out @13-Sep
  - P10 : < 10 nA @1.0 kV [~26-Sep]

BDC3 -2

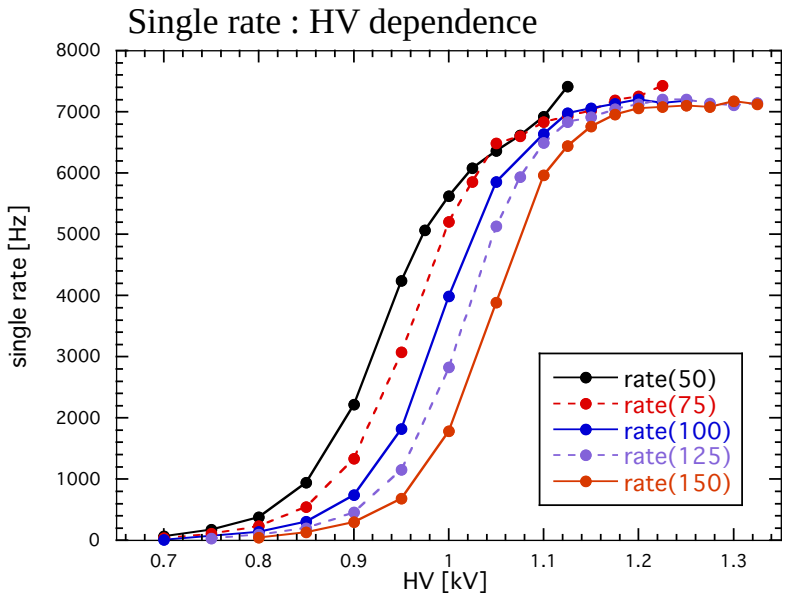
- Test in low-pressure box using i-C_4H_{10} [26-Sep~]
  - P= 100 torr
  - all planes connected, $V_k = V_p$
    - V_p trips sometimes at 0.90~0.95 kV
    - V_k can be applied up to 1.25 kV (plateau for MIP)
  - Y2 disconnected from HV chain, $V_k = V_p$
    - OK: I_k, I_p < 10 nA up to 1.25 kV (MIP sensitive)



- Status
  - Y2 plane still has some problems
    - no surface leak after ultrasonic cleaning
    - spark from wire kink or HV lead ?
  - Other 7 planes are OK
  - plan
    - disassemble and check Y2 plane again

BDC4

- Transported from Riken to Tohoku [17-Sep]
- HV conditioning using P10 [17-Sep ~ 26-Sep]
- Test in low-pressure box [27-Sep]
  - conditions
    - ASD: 80nsec, V_{th}=-0.4 V
    - i-C_4H_{10} : P= 50 ~ 150 torr
    - $V_k = V_p$
    - collimated β-rays [MIP]
  - single rate check
    - very stable, OK
    - MIP sensitive for P > 100 torr
  - leak current
    - I_k, I_p < 10 nA at highest HV applied
  - All channels alive : checked by visual scaler



- Status
  - BDC4 is in a good condition : OK
  - BDC4 + low-pressure box : one spare BDC ready

Summary @30-Sep-2016

- One BDC spare (BDC4 + box) : ready
- Plan
  - repeat the same procedure for BDC5 (now in Riken)
  - more work (Y2 is still bad) on BDC3
  - prepare new 10 PCB's, 4 PCB's with wires
  - plan to prepare 2 or 3 BDC spares