Status of Discharge Measurement

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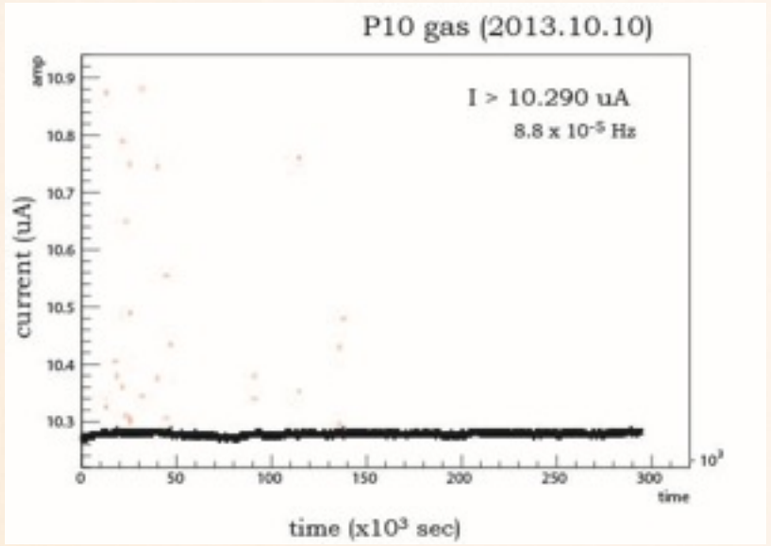
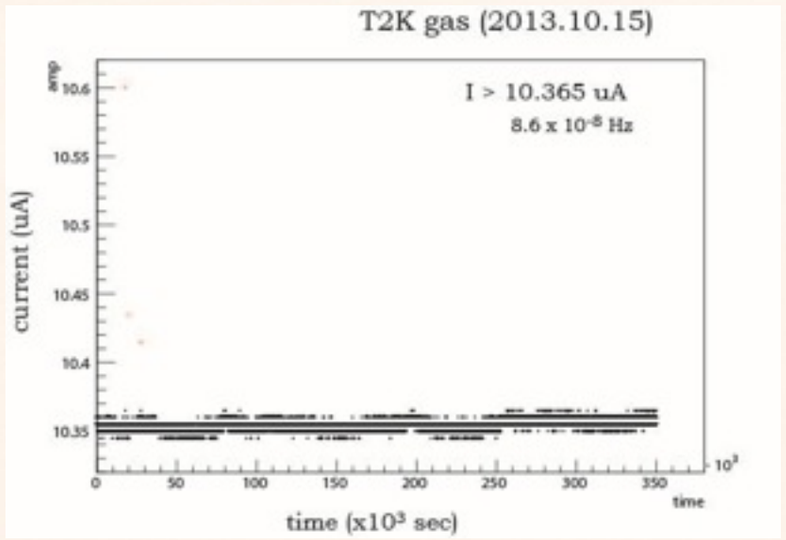
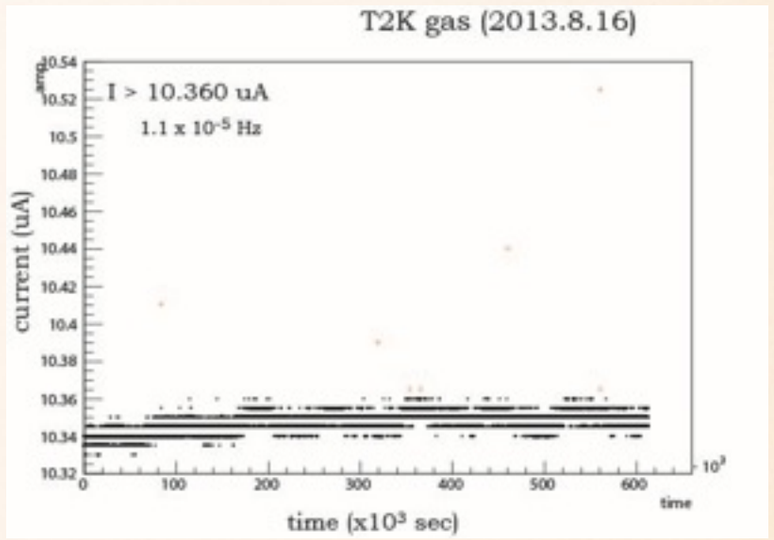
Previous Result

- HV module: CAEN N1470A (resolution - 5nA)
- GEM: Scienergy 100μm (10cm X 10cm)
  double GEM structure (same as large prototype)
- Gas: P10, T2K(Ar 95%+CF_4 3%+i-C_4H_{10} 2%)

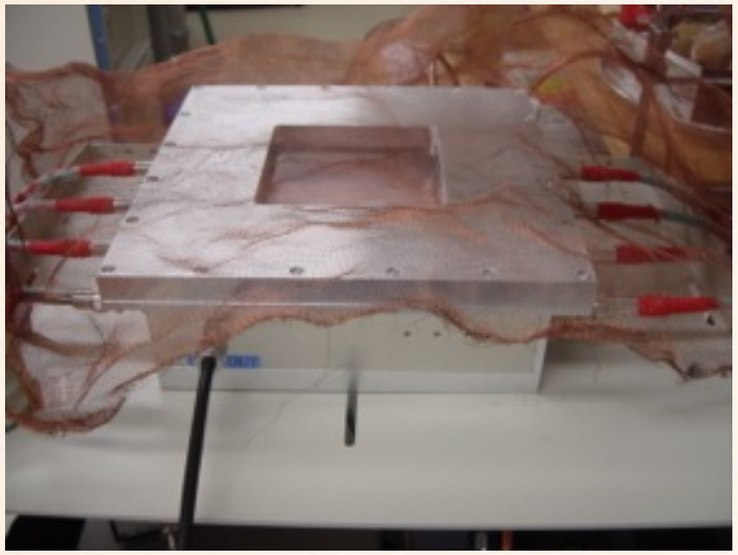




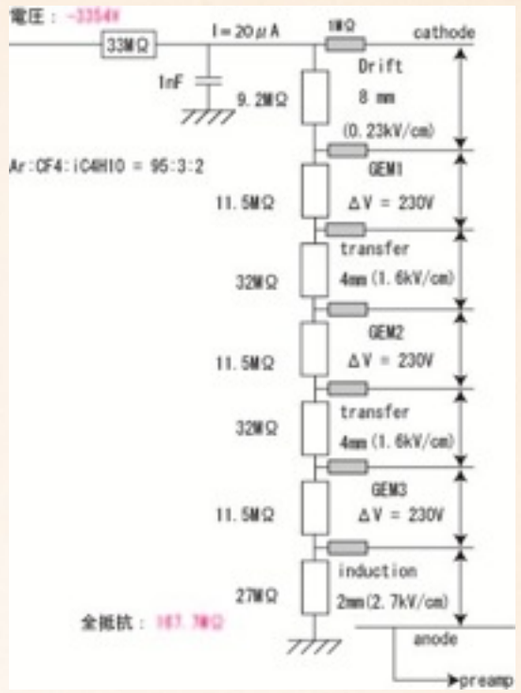


The discharge rate: P10 - 8.8×10^{-5} Hz, T2K - 1.1×10^{-5} Hz

New chamber and GEM's

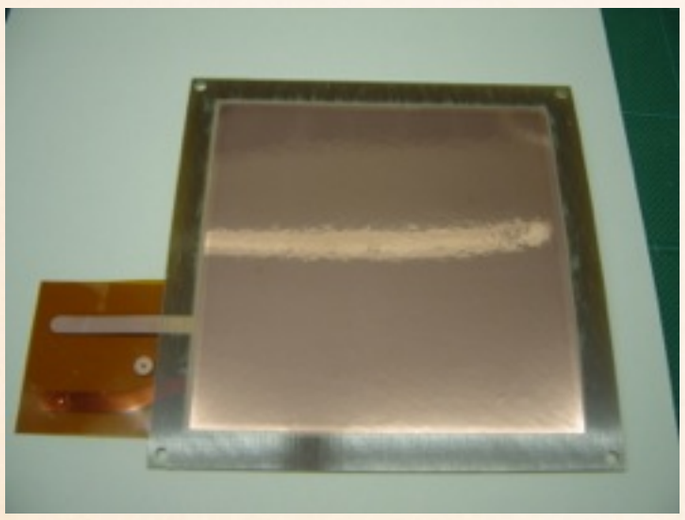


- chamber size is almost same as previous
- good airtightness

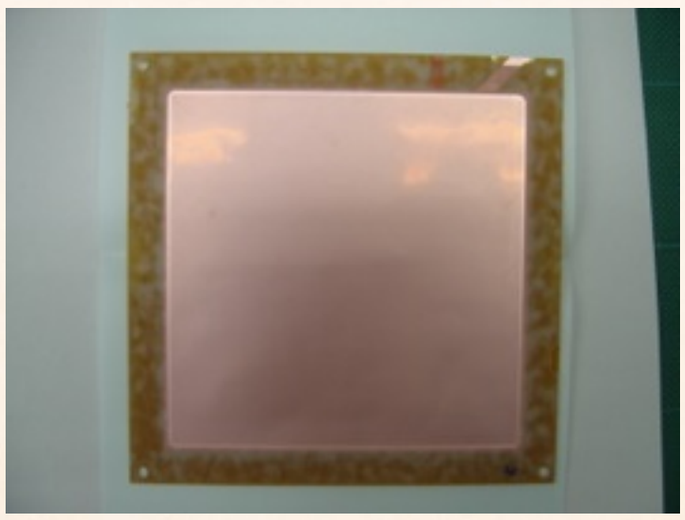


Chamber setup

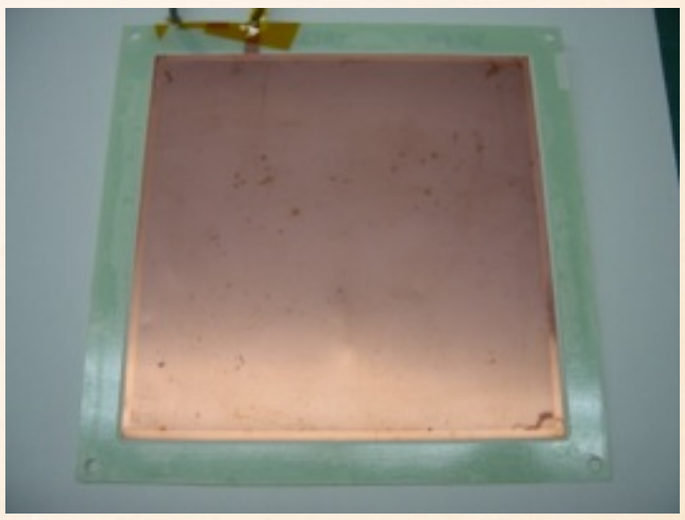
CERN GEM



Raytech GEM

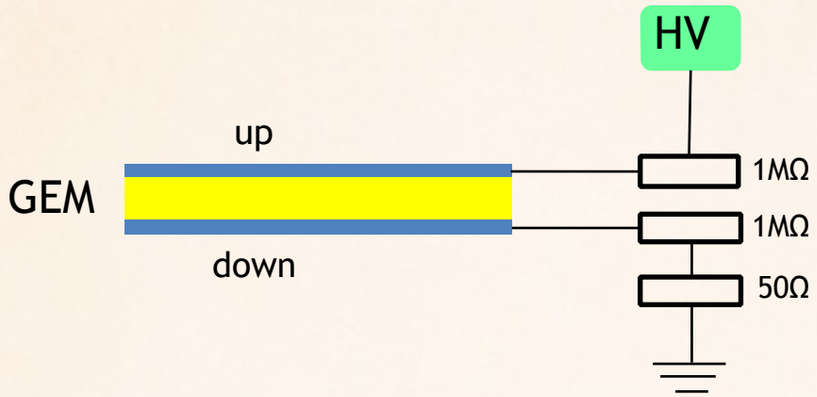


Scienergy GEM

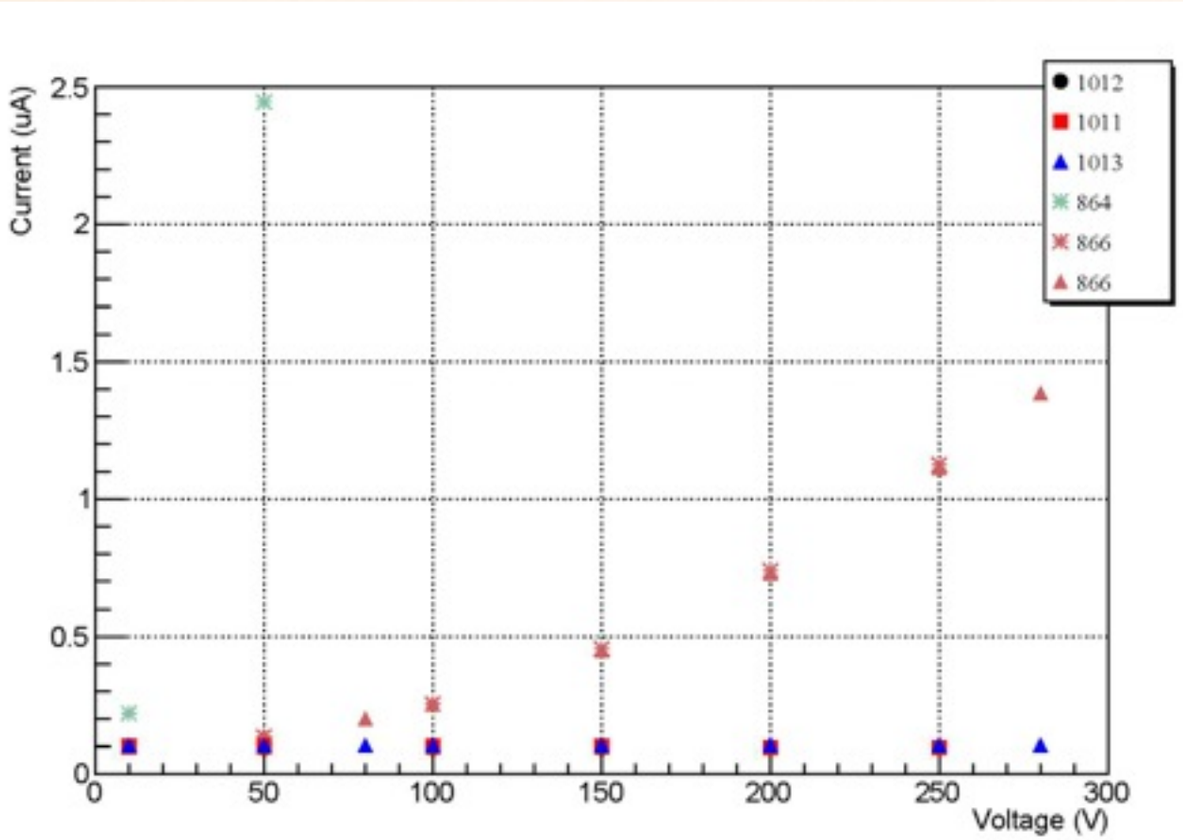


- Size is same (10cm X 10cm, t=50μm).
- Surface luster is different (CERN GEM has most luster)

Current Measurement of Scienergy GEM



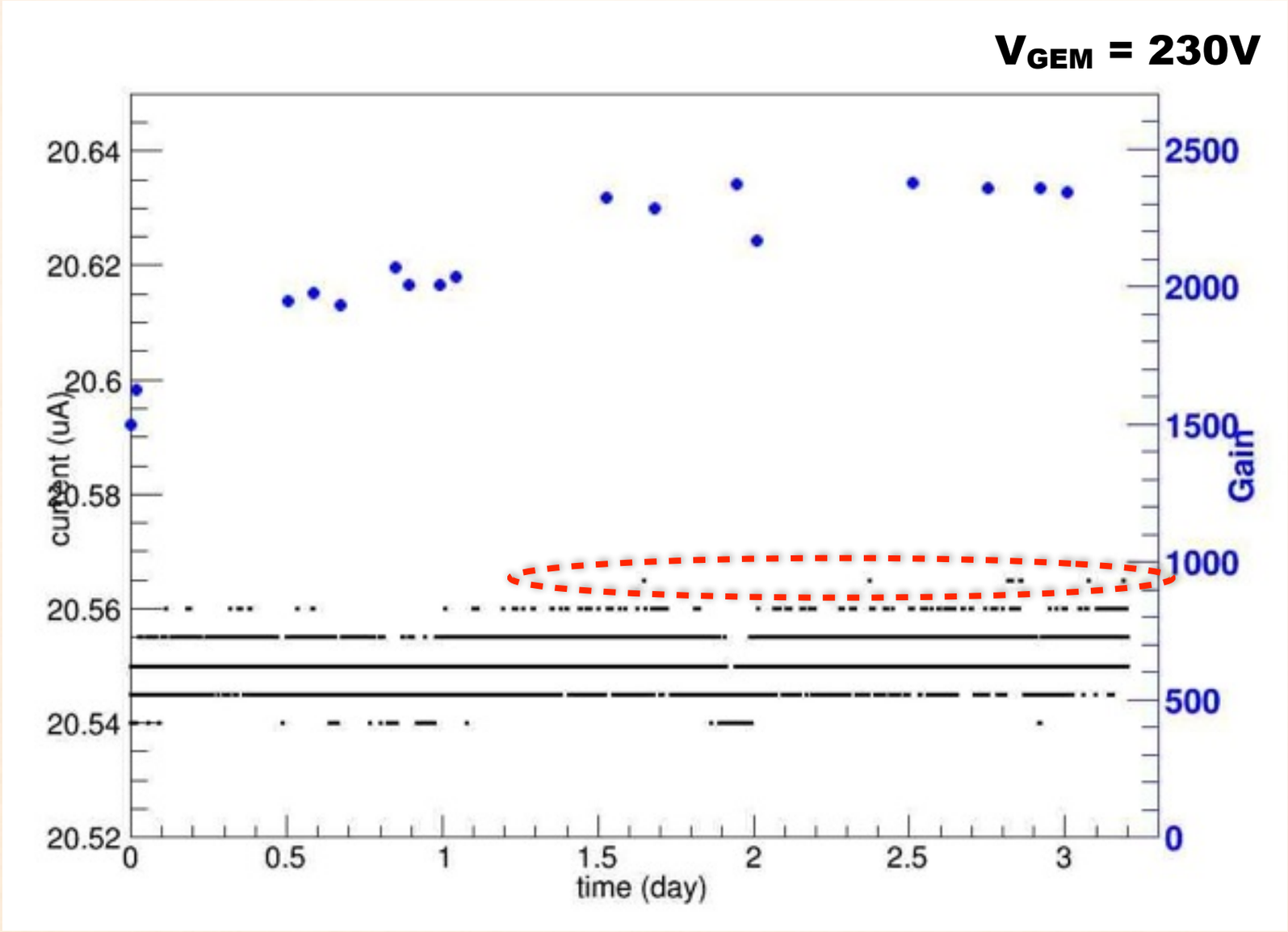
- **HV module (CAEN N1407A) shows current and voltage.**
- **Apply voltage (0 – 300 V) to GEM in N_2 gas and measure current .**
- **5 GEM are measured**



3 GEM (1011, 1012, 1013) have no conductivity (working). But 1011 was broken after this measurement by mistake.

Order new GEM

Discharge Measurement of Raytech GEM



Nominal current
20.550 μA

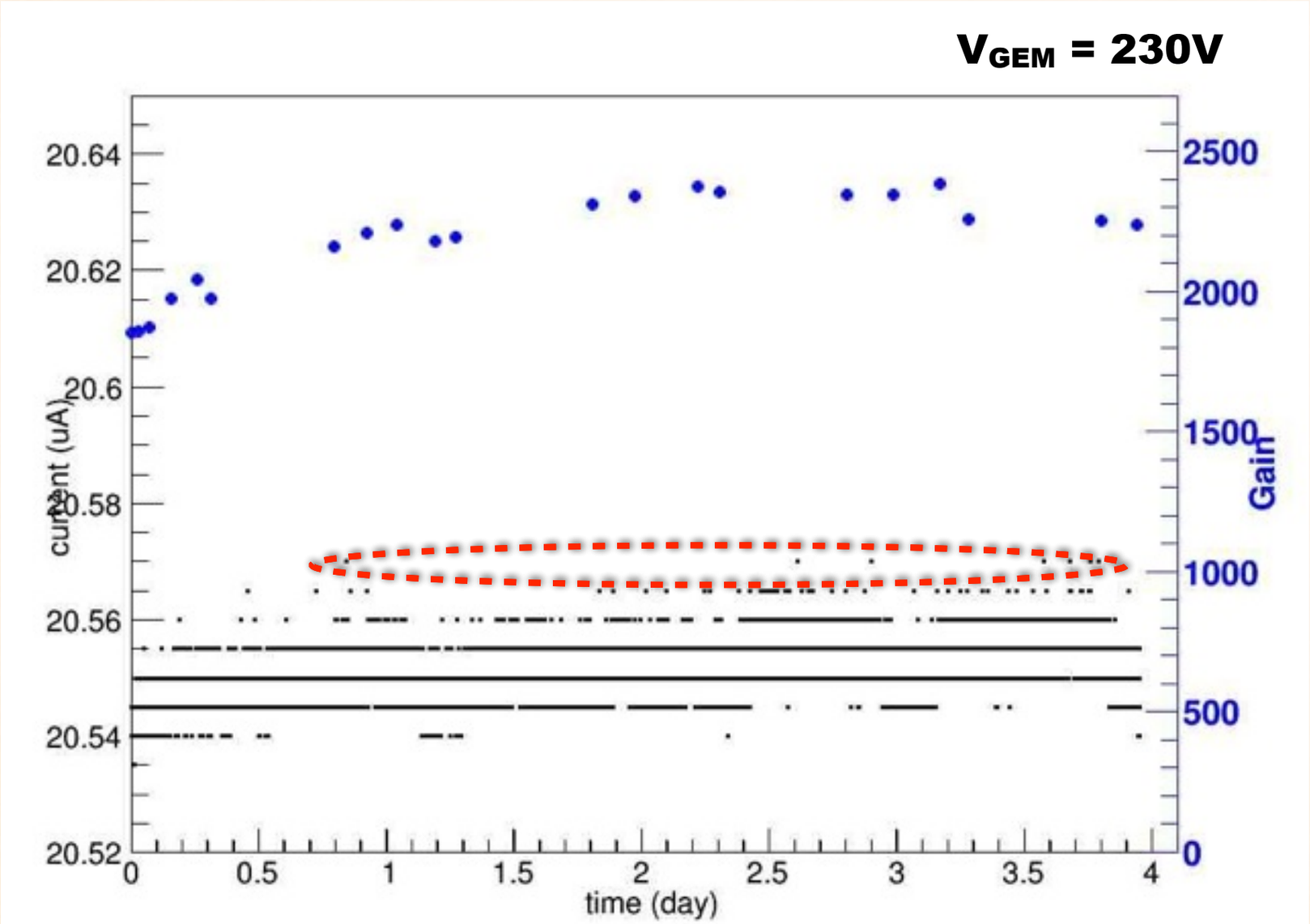
Current by discharge
> 20.560 μA

Discharge rate

2.9×10^{-5} Hz

(8 tims/276431 sec)

Discharge Measurement of CERN GEM



Nominal current
20.550 μA

Current by discharge
> 20.565 μA

Discharge rate

2.1×10^{-5} Hz

(7 tims/341301 sec)

Current by discharge
> 20.560 μA

Discharge rate
1.6×10^{-4} Hz
(56 tims/341301 sec)

Summary

- Discharge measurement of 50μm GEM has been started.
- Discharge rate: Raytech - 2.9×10^{-5} Hz, CERN - 2.1×10^{-5} Hz. Discharge rate of two GEMs aren't different from each other.
- Scienergy 50μm and 100μm GEM will be measured.
- I borrowed dew point recorder from Saga Univ. and O_2 monitor from KEK. I will set up them soon.