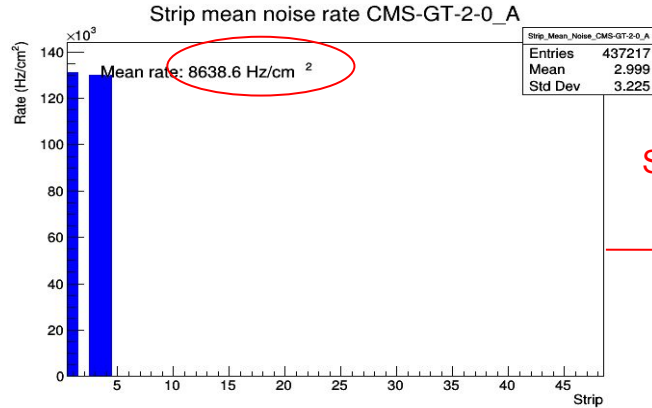# Rate Scan CMS-GT-2-0

Mapse Barroso Ferreira Filho

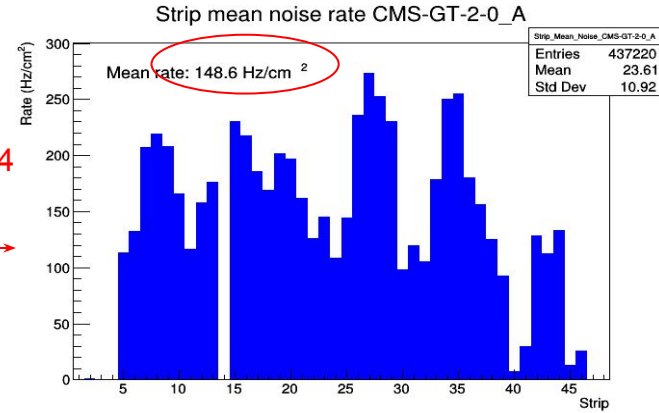Ecogas meeting - 26/May/2021

Rate Scan: CMS-GT-2-0

- Conditions:
  - **Date:** 18 May, 2021;
  - **Scan ID:** 210;
  - **Absorption factor:** 6.9;
  - **Gas:** Standard gas mixture (95.2 % $C_2H_2F_4$, 4.5 % i-C_4H_{10}, 0.3 % SF_6);
  - **Scan Voltages:** 9000 V, 9400 V, 9600 V, 9800 V.

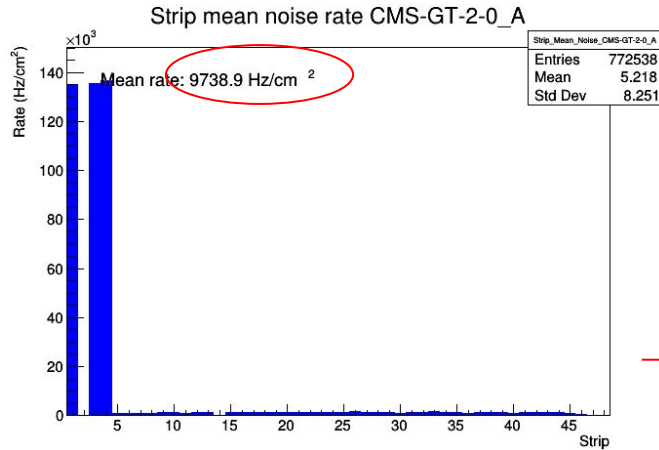# Rate Scan analysis: Partition A: 9000 V
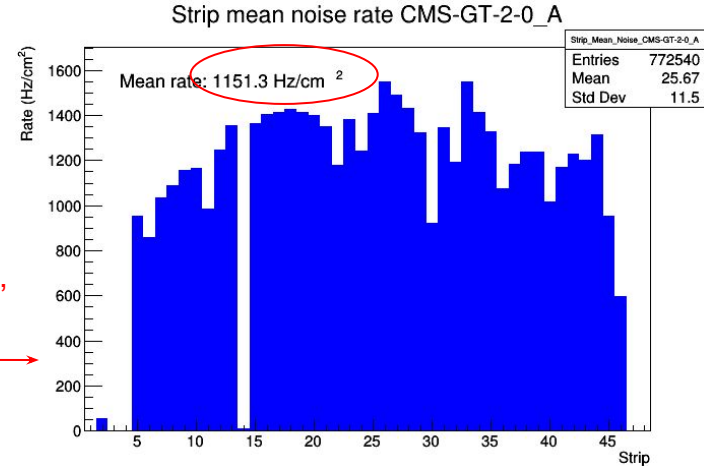

Strips 1, 3, 4 masked

Comments
- Strips 1, 3 and 4 with very high noise ~ 10^5;
- After masking we see a consistent mean rate.
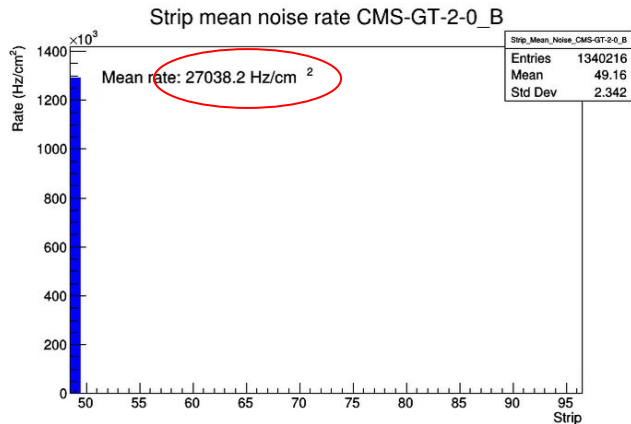
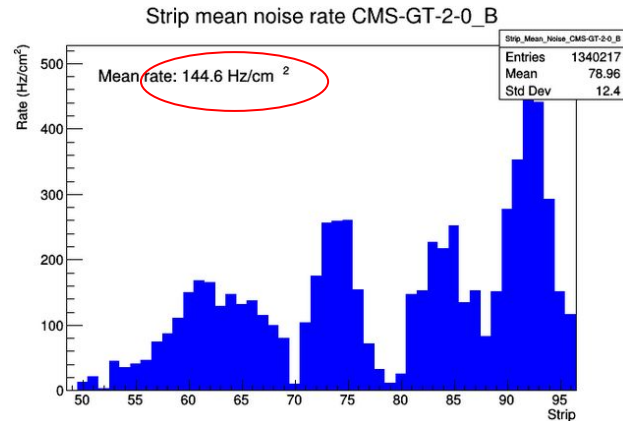# Rate Scan analysis: Partition A: 9800 V

Strips 1, 3, masked

Comments
- Strips 1, 3 and 4 with very high noise ~ 10^5;
- After masking we see a consistent mean rate.
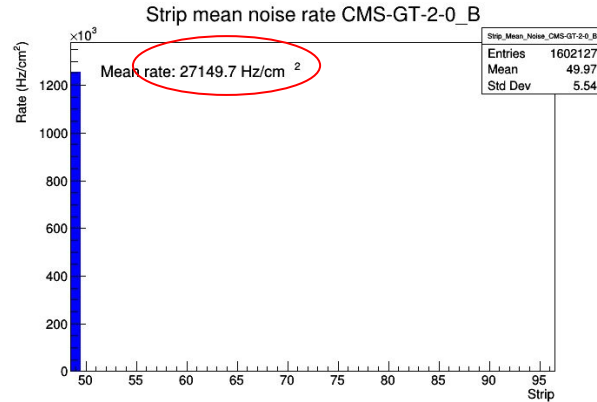- More populated events

Rate Scan analysis: Partition B: 9000 V

Strip mean noise rate CMS-GT-2-0_B

Mean rate: 27038.2 Hz/cm^2

Strip_Mean_Noise_CMS-GT-2-0_B	
Entries	1340216
Mean	49.16
Std Dev	2.342

Strip 49 masked →

Strip mean noise rate CMS-GT-2-0_B

Mean rate: 144.6 Hz/cm^2

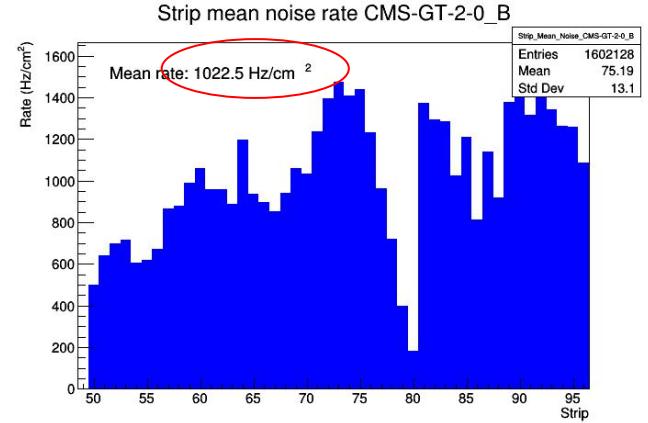| Strip_Mean_Noise_CMS-GT-2-0_B	
Entries	1340217
Mean	78.96
Std Dev	12.4

Comments
- Strip 49: very high noise ~ 10^6
  (This strip is already unsoldered);
- After masking we see a consistent
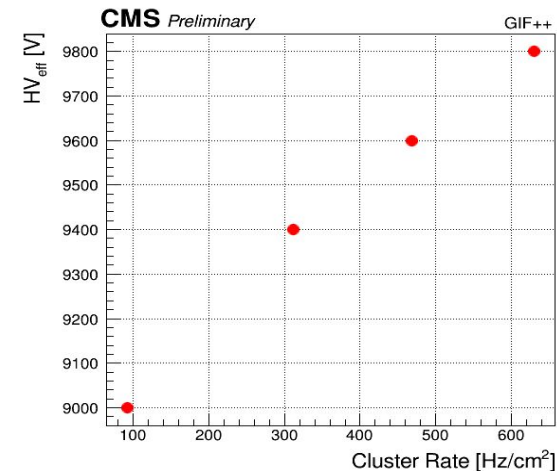 mean rate.

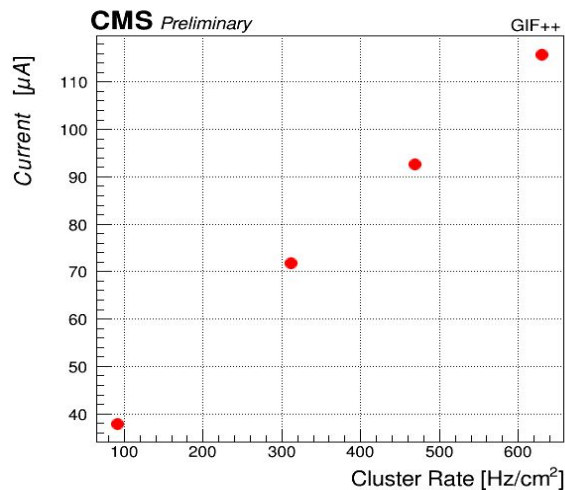# Rate Scan analysis: Partition B: 9800 V

Strip 49 masked

Comments
- Strip 49: very high noise ~ 10^6
  (This strip is already unsoldered);
- After masking we see a consistent
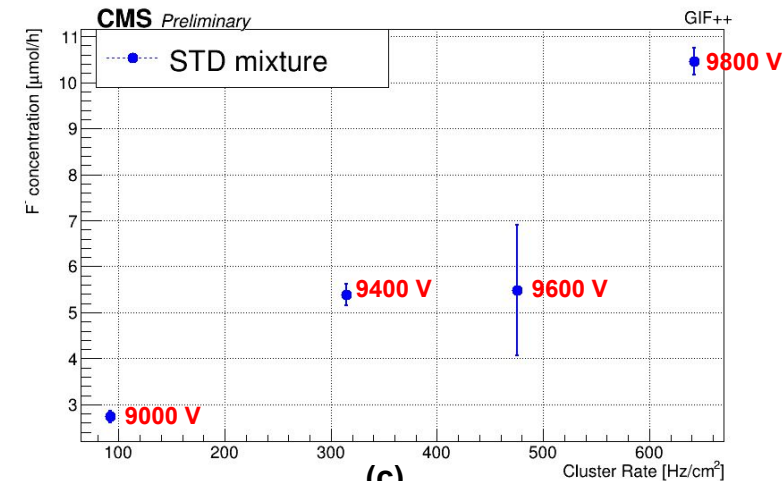 mean rate.

Rate Scan plots

(a)

(b)

(c)

(a) HV x Cluster Rate: Linear dependent. The highest rate observed is 642 Hz/cm².
(b) Current x Cluster Rate: Same as **(a)**
(c) F⁻ concentration x Cluster Rate: Linear dependent. Note the point at 9600 V -> Considerable error.
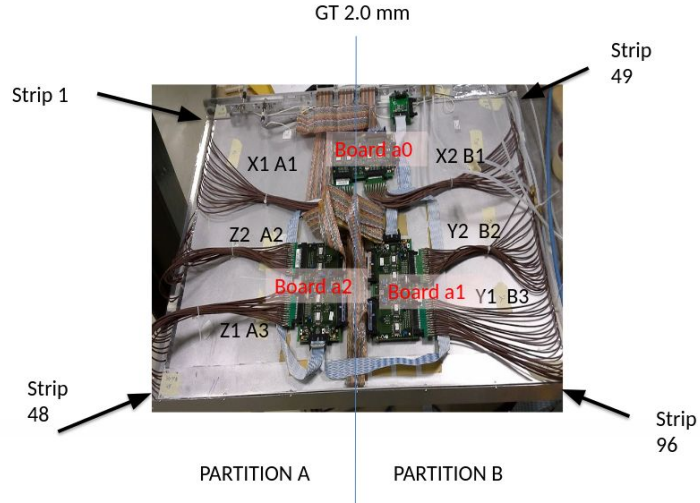
High rate -> High F⁻ concentrations.

Conclusions/Next steps

- Analyse the noisy strips for scans with ECOMIX2
- Try to fix the problematic strips (Bring the chamber to 904 -> solder strips to the ground -> validade the chamber -> Bring it back to GIF++). This take time to be done, maybe after the ECOMIX1 HF measurements?
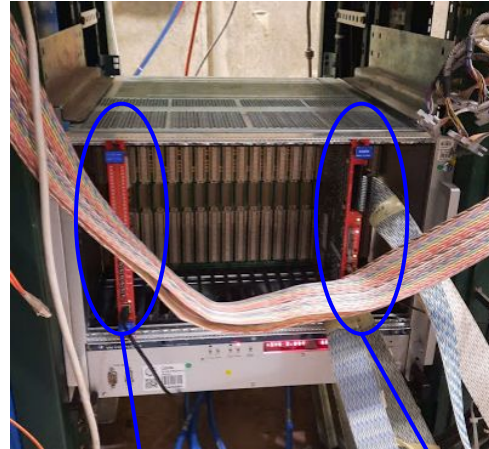
BACKUP

System Setup

Chamber: CMS-GT-2-0

Strip 1

GT 2.0 mm

Strip 49

Board a0

X1 A1   X2 B1

Z2 A2   Y2 B2

Board a2   Board a1   Y1 B3

Z1 A3

Strip 48

Strip 96

PARTITION A   PARTITION B

Trigger setup

V1718 Bridge module

TDC module V1190A

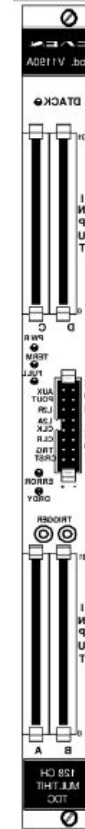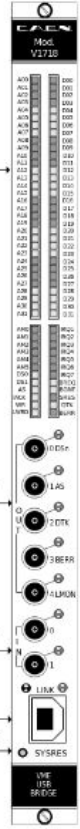
TDC   Bridge

Characteristics:
- Gas gap thickness: 2 mm
- Electrodes thickness: 2mm
- Two partitions: A and B
- 3 CMS RPC FEBs
- 96 strips, 32 per FEB
- Area: 7000 cm² (according to Webdcs) -> To be checked with colleagues
- WP: ??