

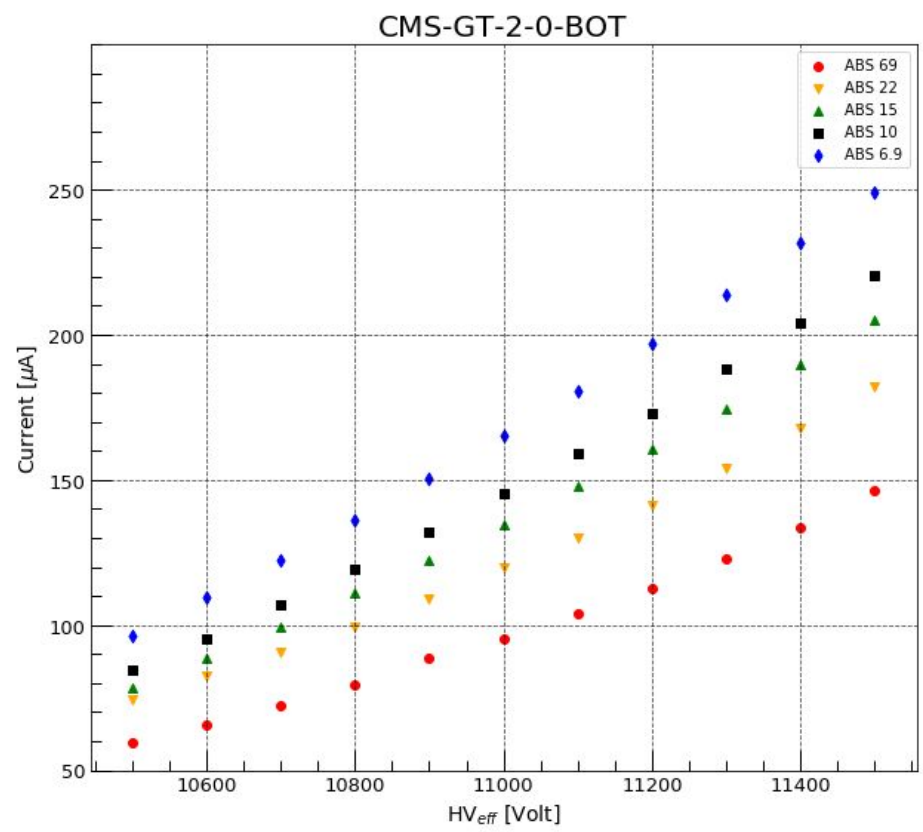
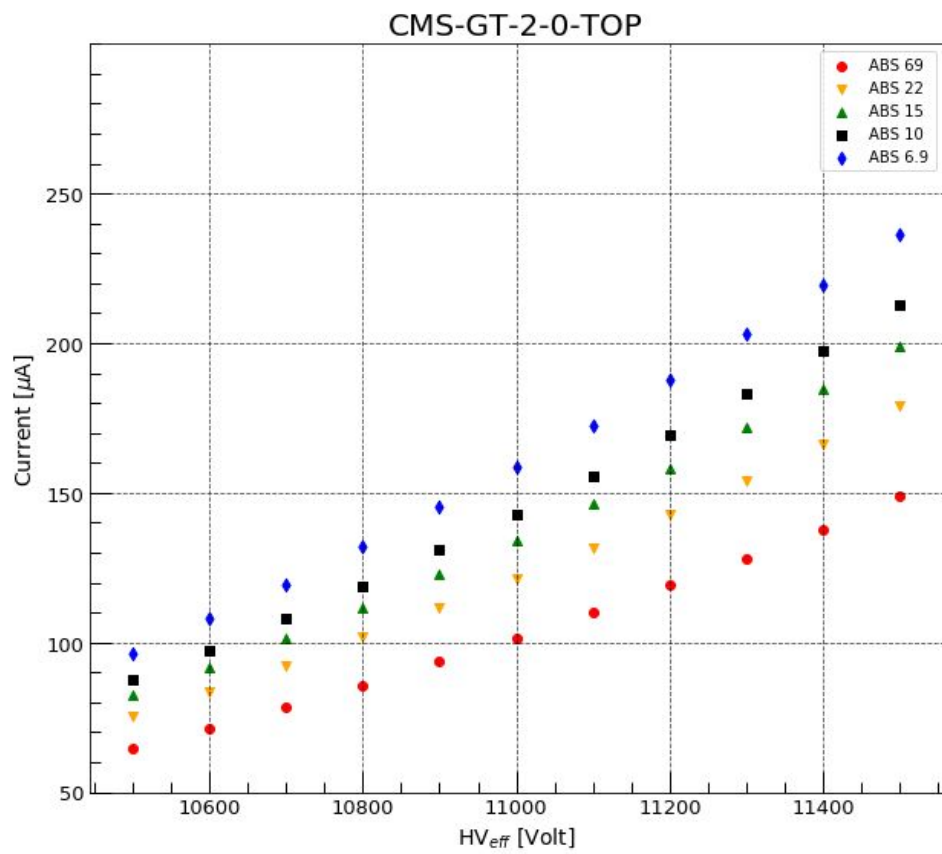


Ecogas Study Rate Scan - Data Analysis

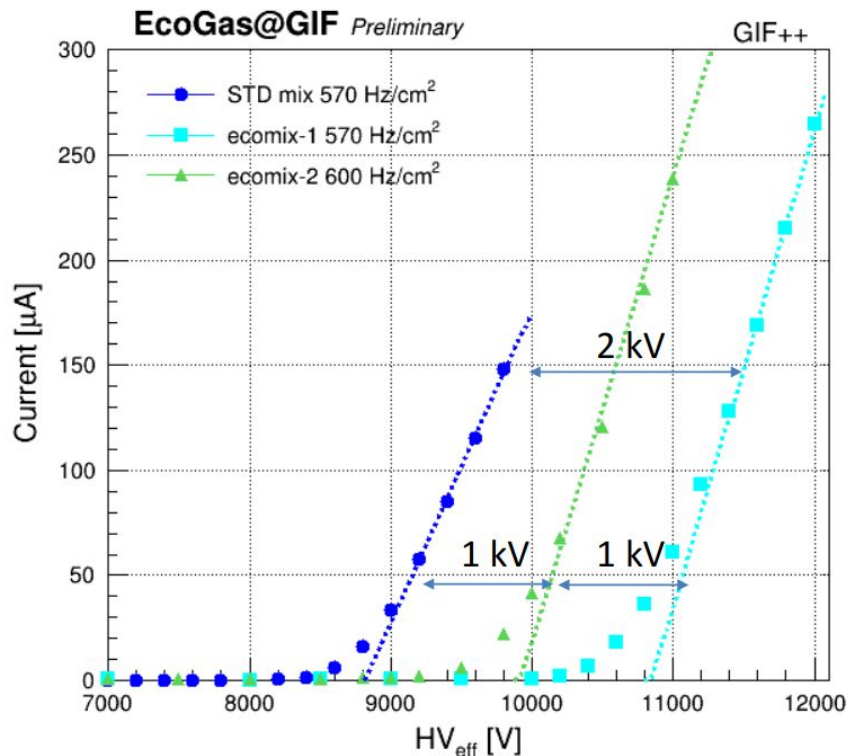
Amrutha Samalan

- ECOGAS1: 45% HFO, 50% CO₂, 4% iC₄H₁₀, 1% SF₆
- ECOGAS2: 35% HFO, 60% CO₂, 4% iC₄H₁₀, 1% SF₆
- Performed rate scans for five different ABS values with **ECOGAS 2** on March 23 (Tuesday) for the **CMS-GT chamber**
- Scan Id and ABS Values:
 - ScanID 00152: ABS 69
 - ScanID 00154: ABS 22
 - ScanID 00155: ABS 15
 - ScanID 00156: ABS 10
 - ScanID 00157: ABS 6.9
- 11 HV points: 10500 V to 11500 V in steps of 100 V
- Analysis performed to study the currents, cluster rate, cluster Size with the previous results (https://agenda.infn.it/event/20374/contributions/102035/attachments/67906/85166/22-11-19_ecogas.pdf)

Current vs HV with ecogas mix-2@ different ABS



CURRENT VS HV



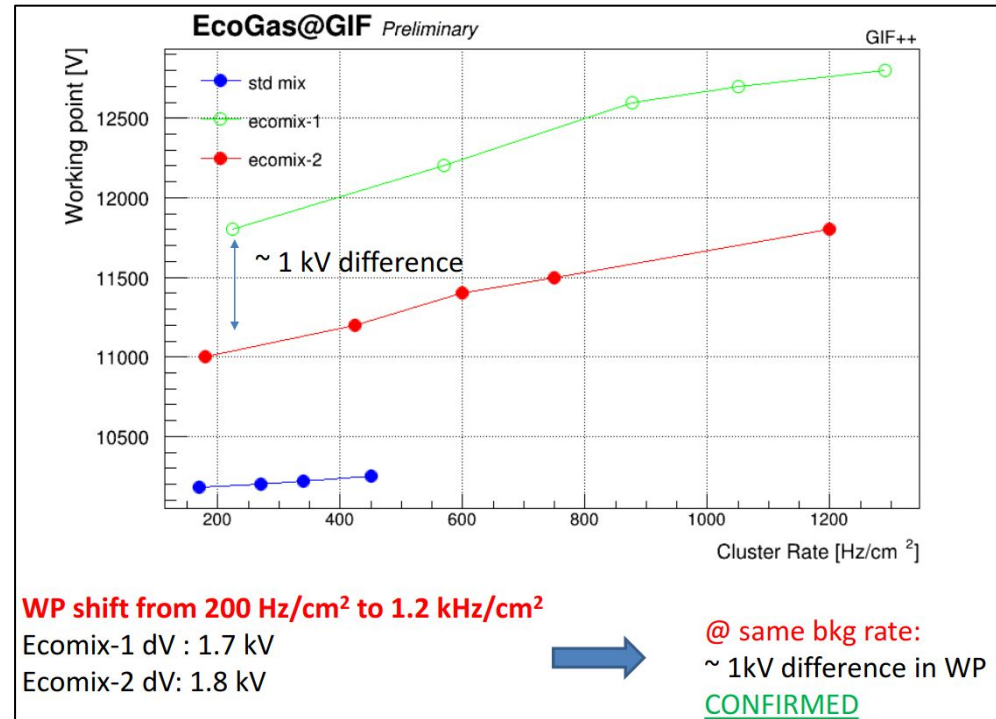
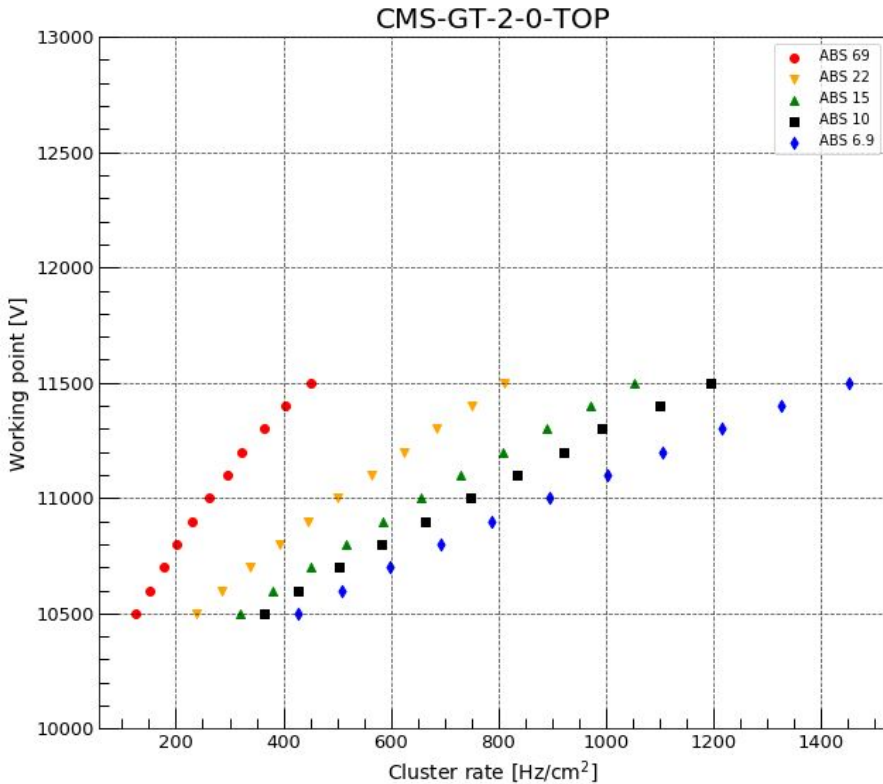
HV shift (linear fit intersection with the X-axis):

- ecomix1 = std + ~2kV

- ecomix2 = std + ~1kV

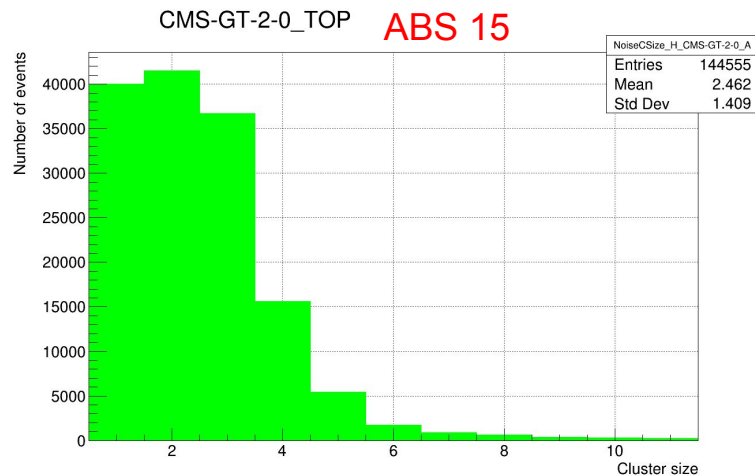
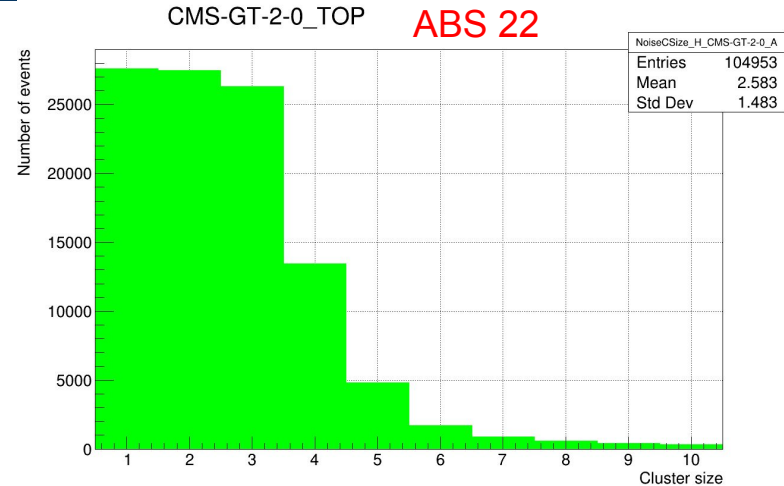
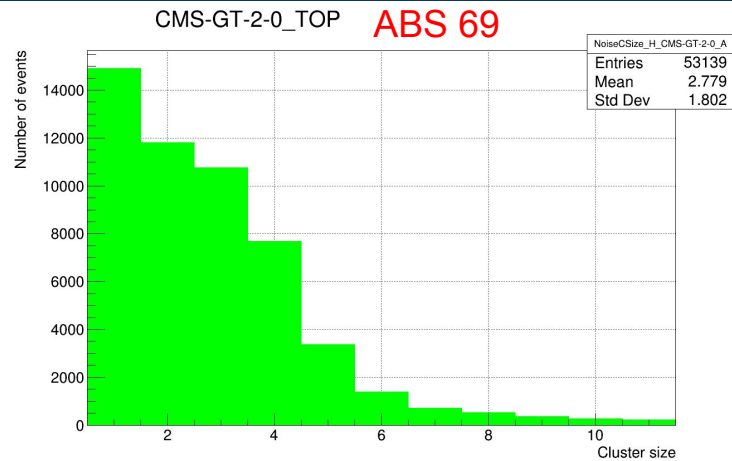
- ecomix2 = ecomix1 + ~1kV

HV vs Cluster rate (strip mean noise rate) with ecogas mix-2@ different ABS

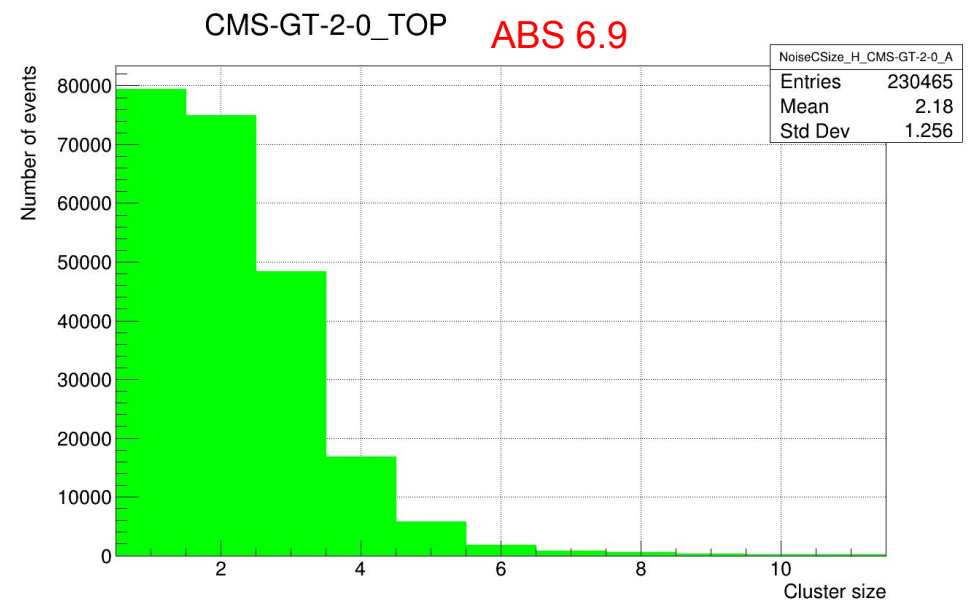
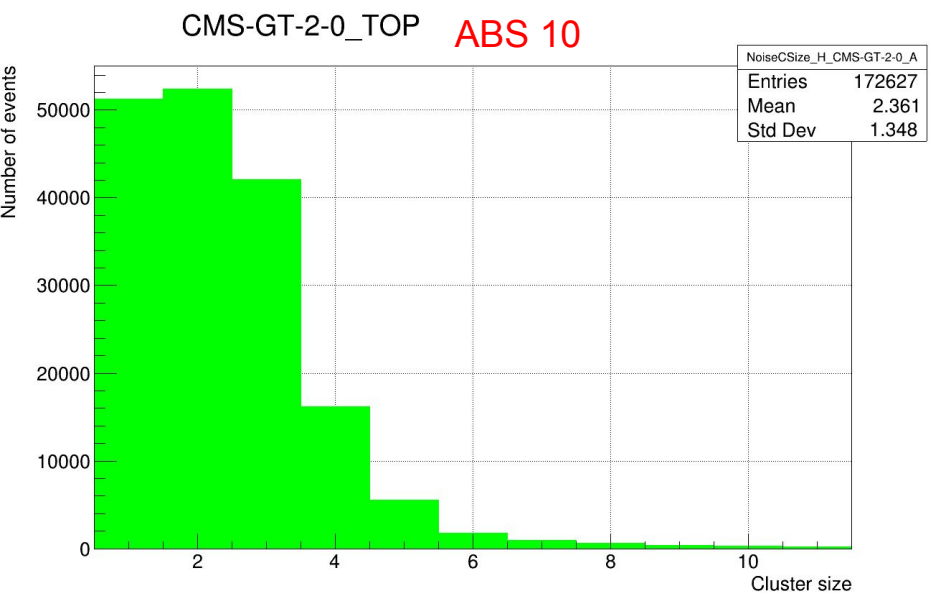


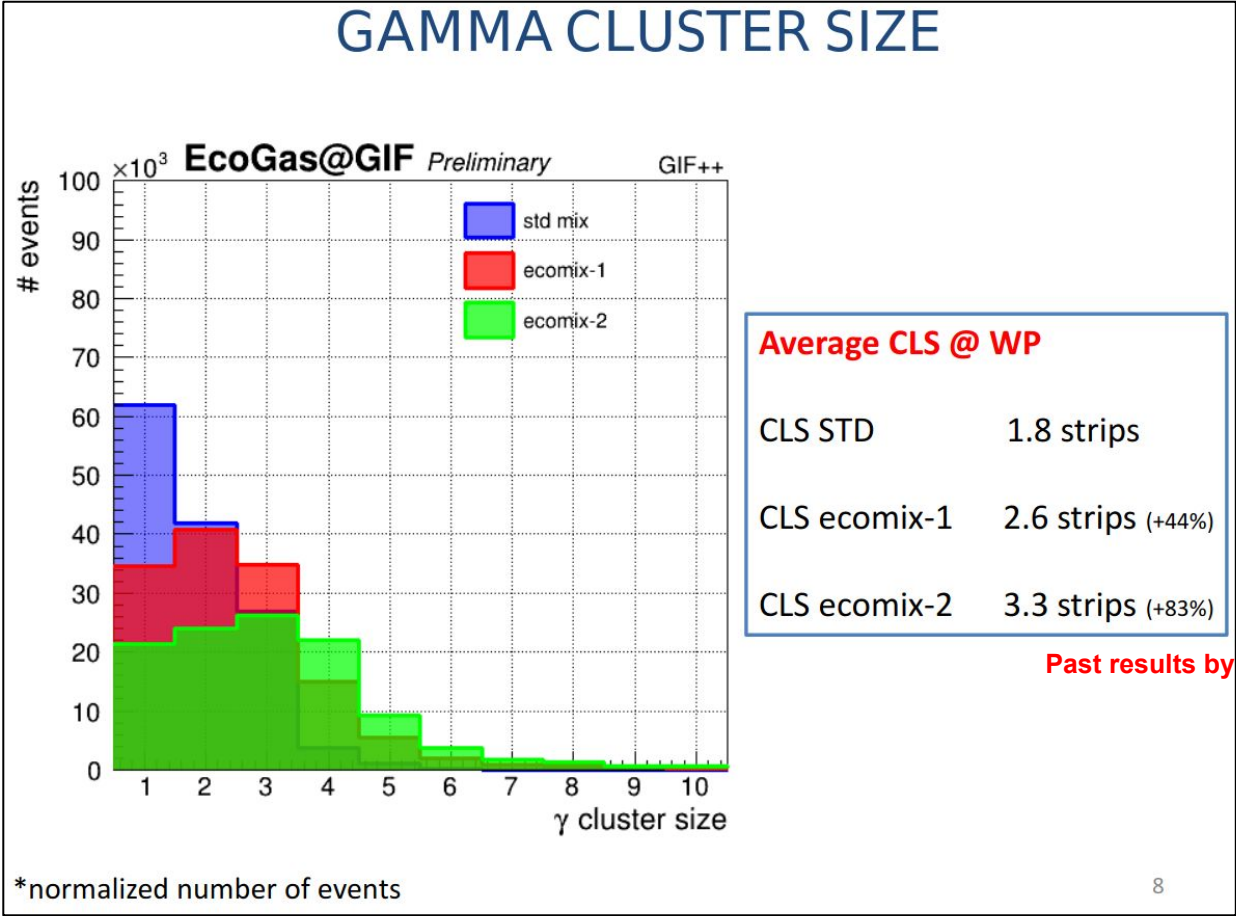
Past results by Andrea

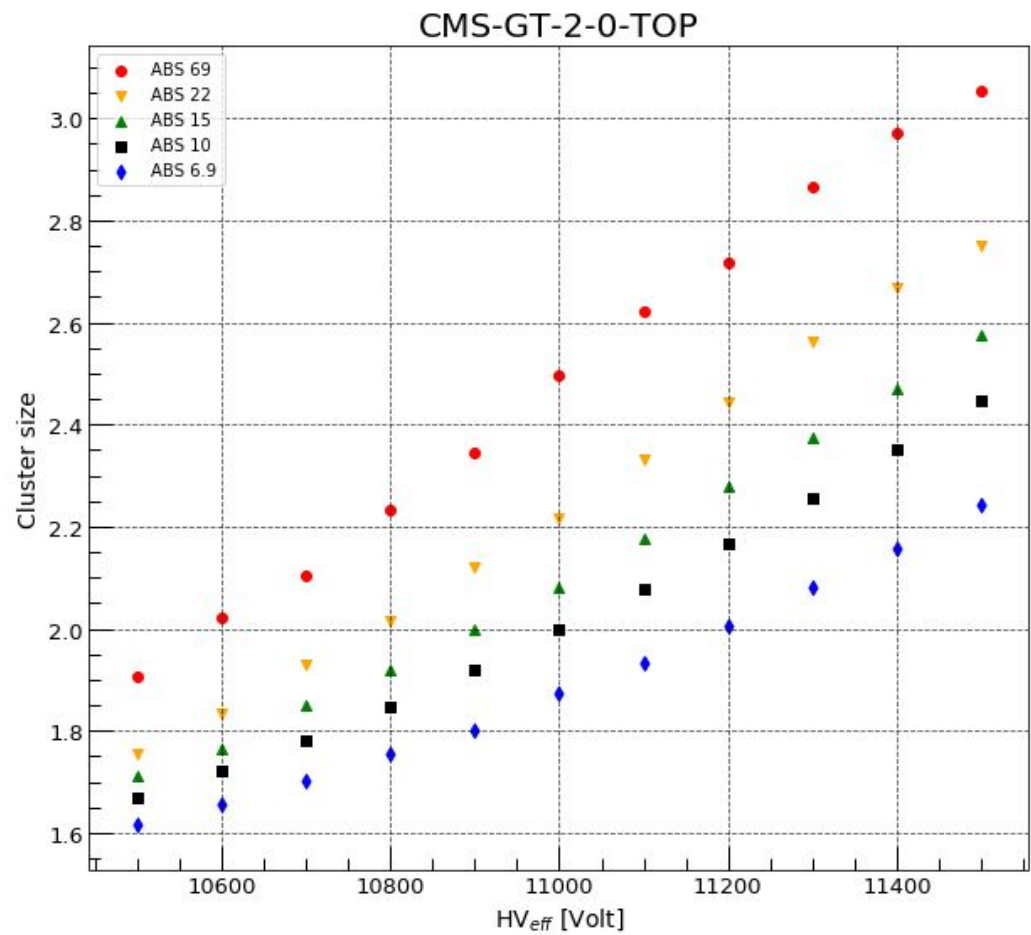
Cluster size histograms with ecogas mix-2@ different ABS



Cluster size histograms with ecogas mix-2@ different ABS





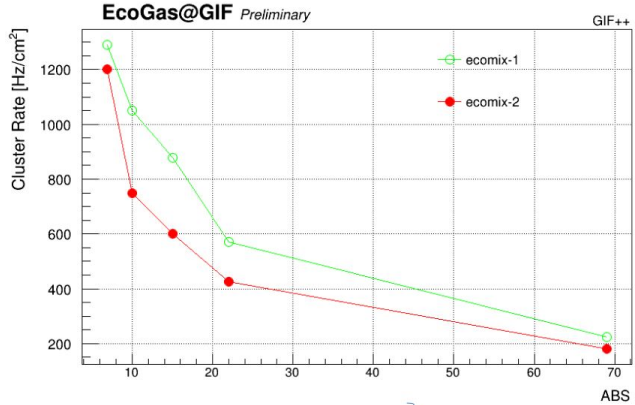


Cluster rate vs ABS factor

Working point: Voltage estimated at the cl. rate plateau

$WP_{\gamma} \approx WP_{\mu} + 400 \text{ V}$

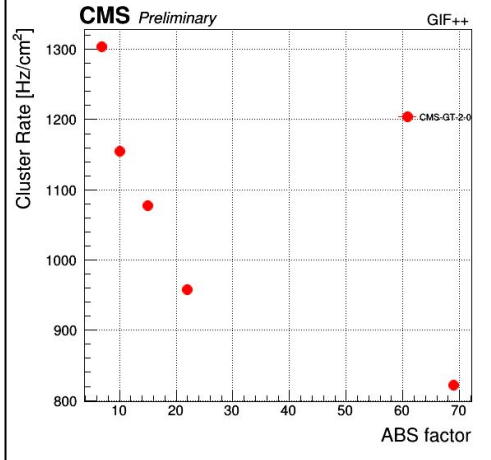
$$\text{Cluster rate} = \frac{\text{hit rate}}{\text{Cluster size}}$$



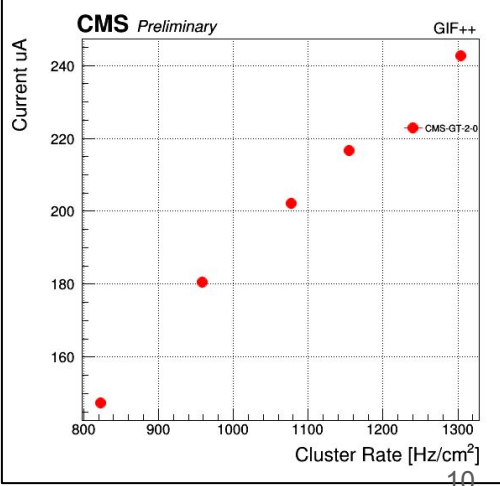
Ecomix-1 → before GIF++ bunker extension
Ecomix-2 → after GIF++ bunker extension

Trolley distance wrt the source:
Almost the same (+ ~ 0.5m)

• Past results by Andrea



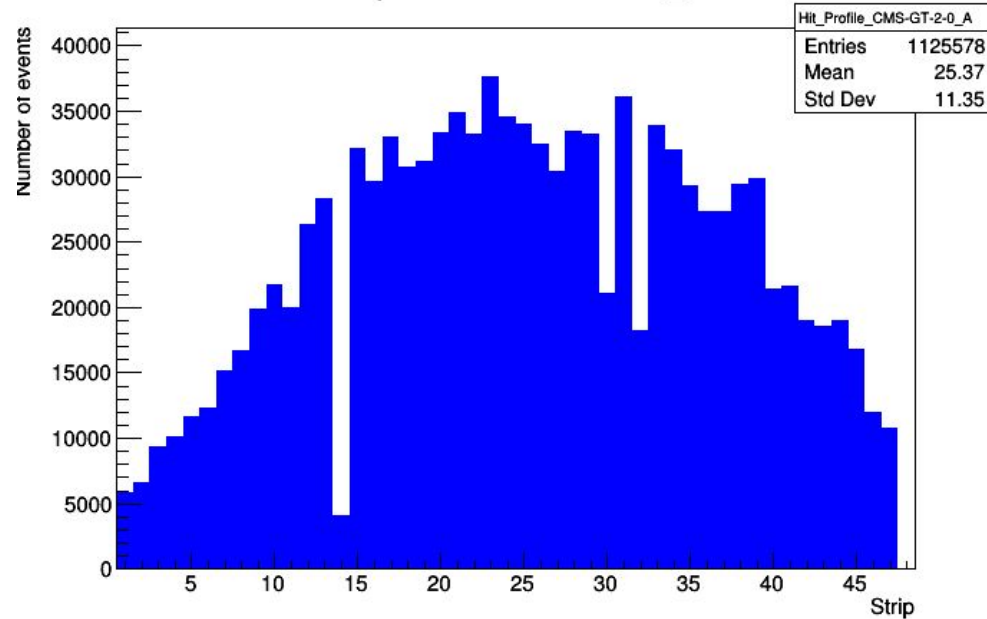
Plots from Mapse



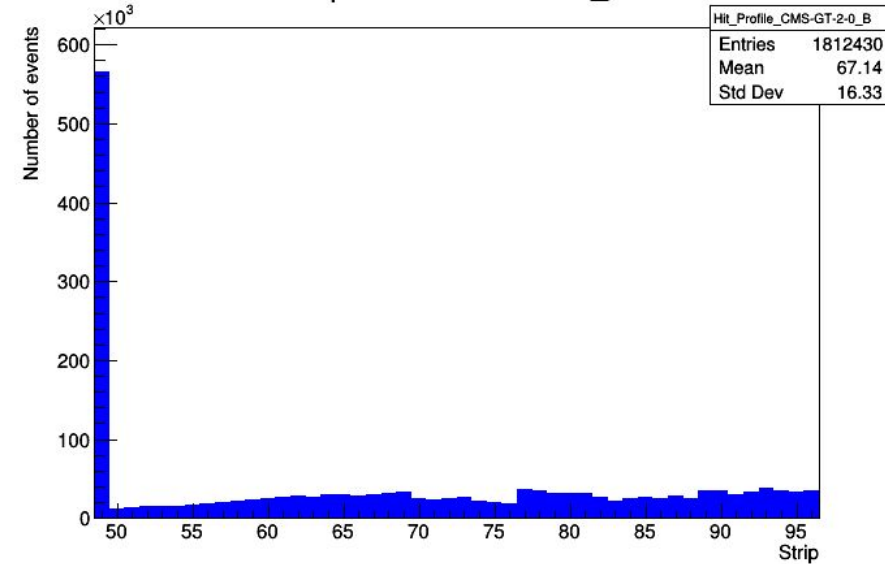
Thank you

- **ECOGAS1: 45% HFO, 50% CO₂, 4% iC₄H₁₀, 1% SF₆**
- **ECOGAS2: 35% HFO, 60% CO₂, 4% iC₄H₁₀, 1% SF₆**
- **Performed rate scans for five different ABS values with **ECOGAS 2** on March 11 (Thursday) for the **CMS-GT chamber****
- **Scan Id and ABS Values:**
 - ScanID 00145: ABS 69**
 - ScanID 00146: ABS 22**
 - ScanID 00147: ABS 15**
 - ScanID 00148: ABS 10**
 - ScanID 00149: ABS 6.9**
- **Analysis performed to study the currents, cluster rate, cluster Size and cluster multiplicity for both gaps- **CMS-GT-2-0-TOP** (partition A) and **CMS-GT-2-0-BOT** (partition B)**

Hit profile CMS-GT-2-0_A

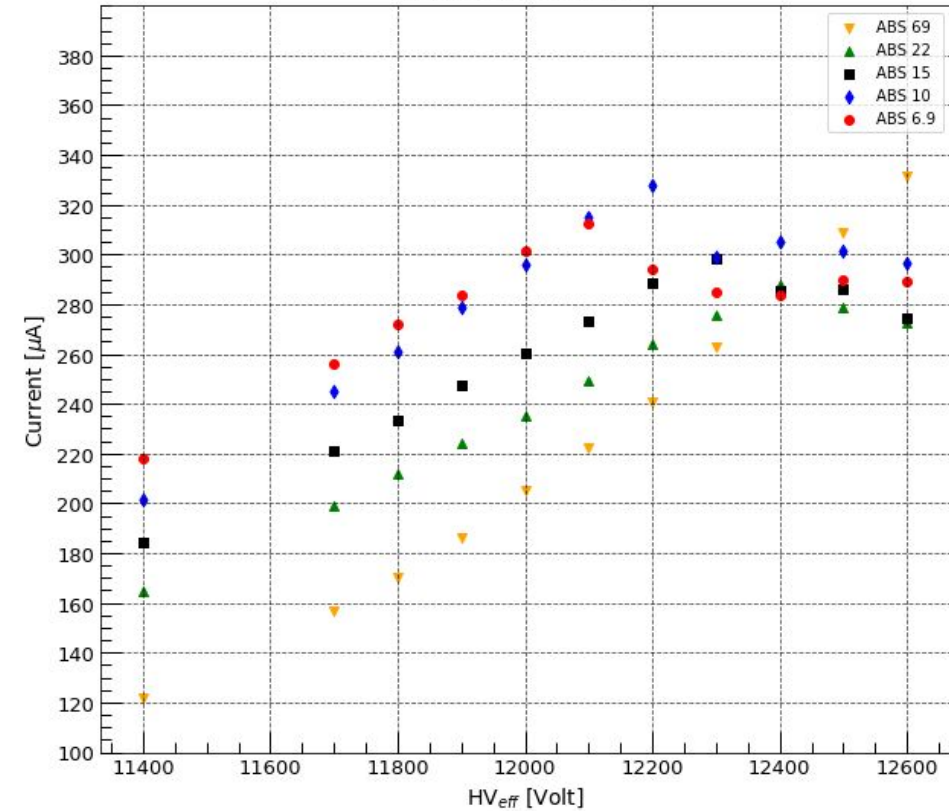


Hit profile CMS-GT-2-0_B

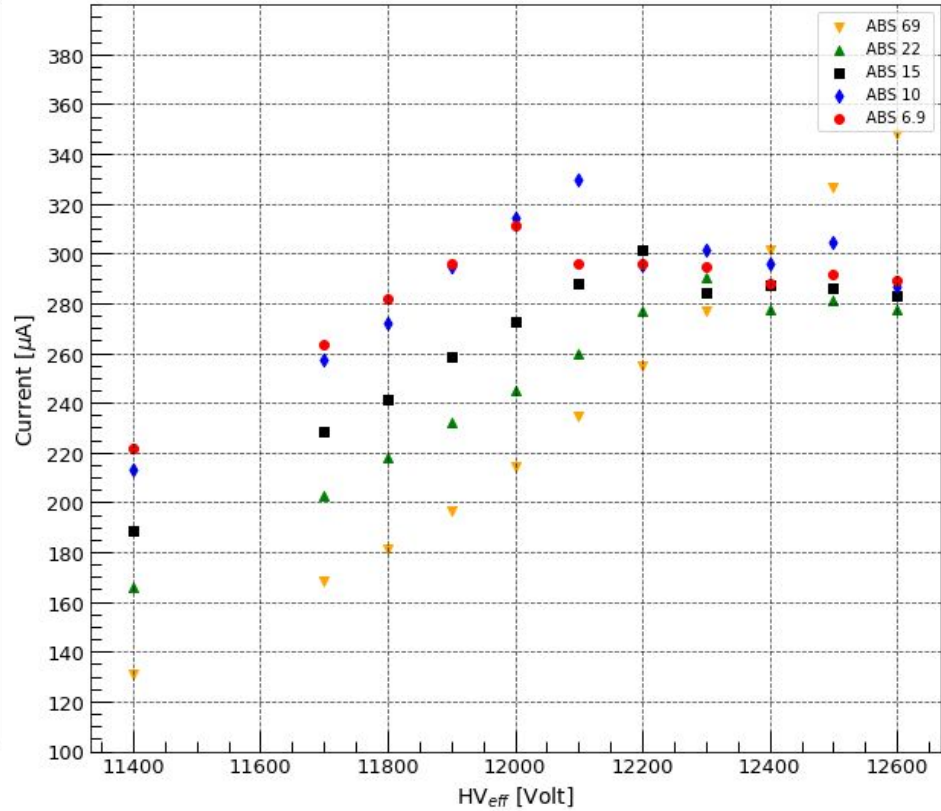


Current vs HV with ecogas mix-2@ different ABS

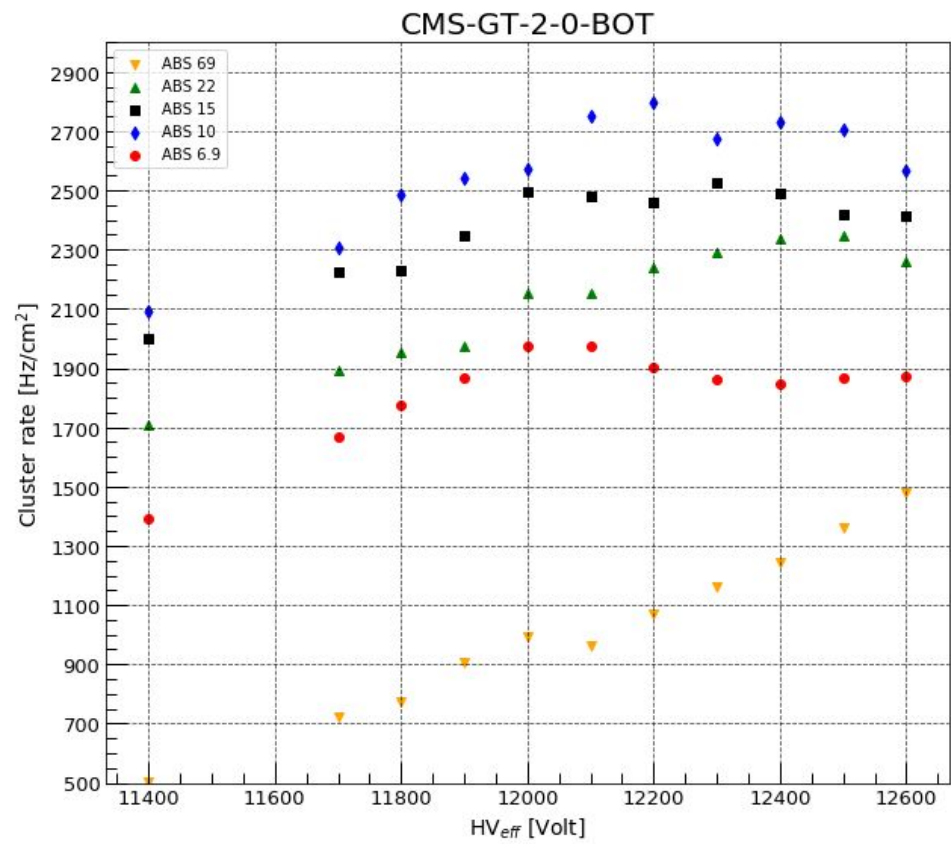
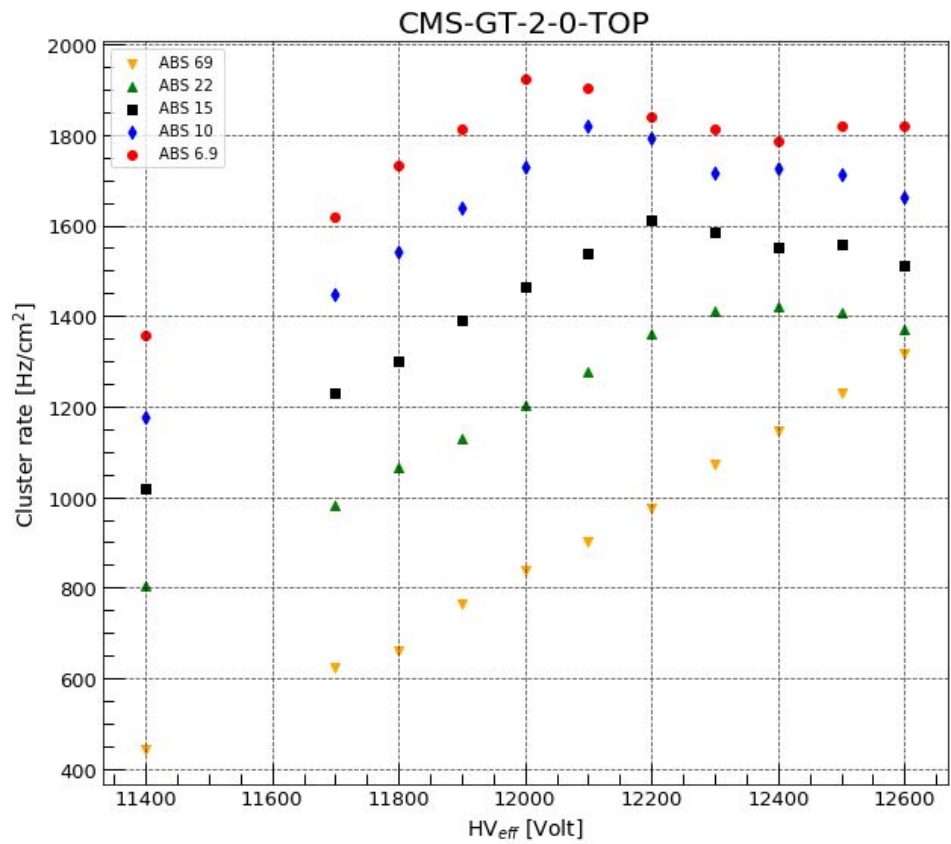
CMS-GT-2-0-TOP



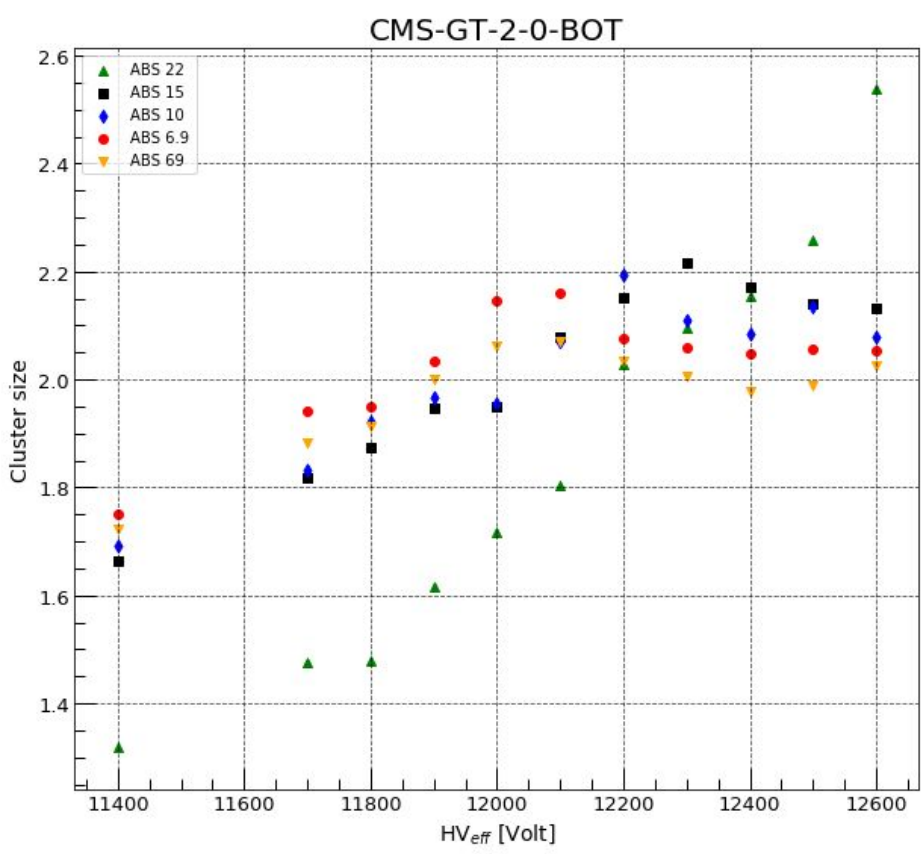
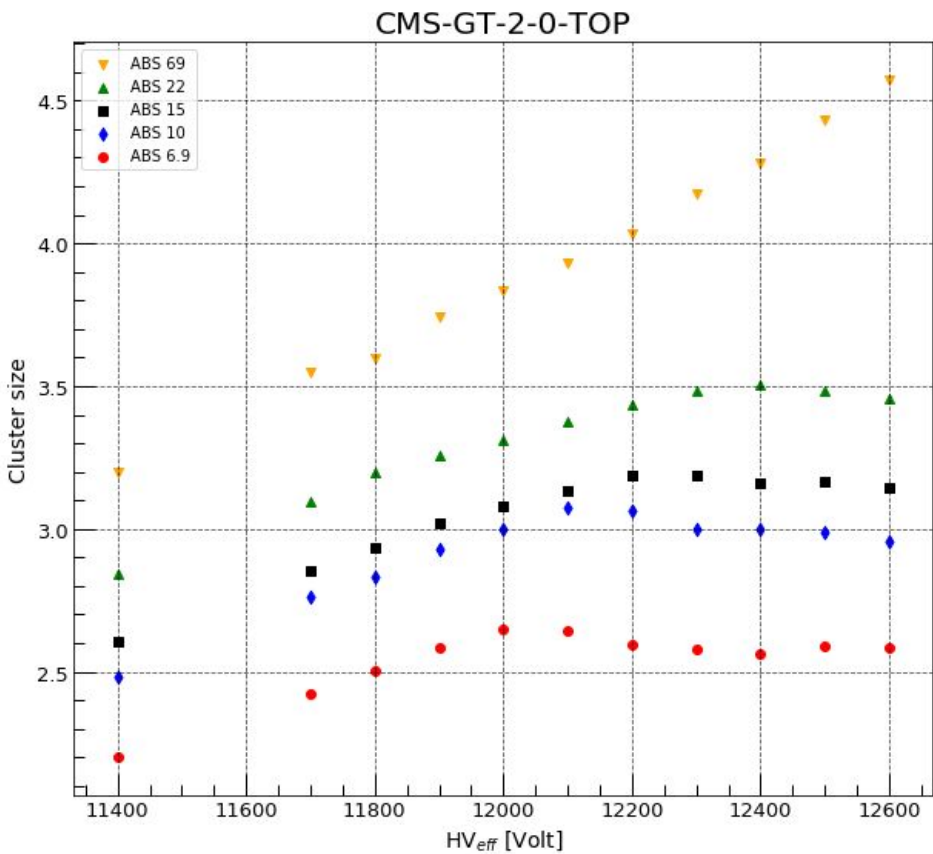
CMS-GT-2-0-BOT



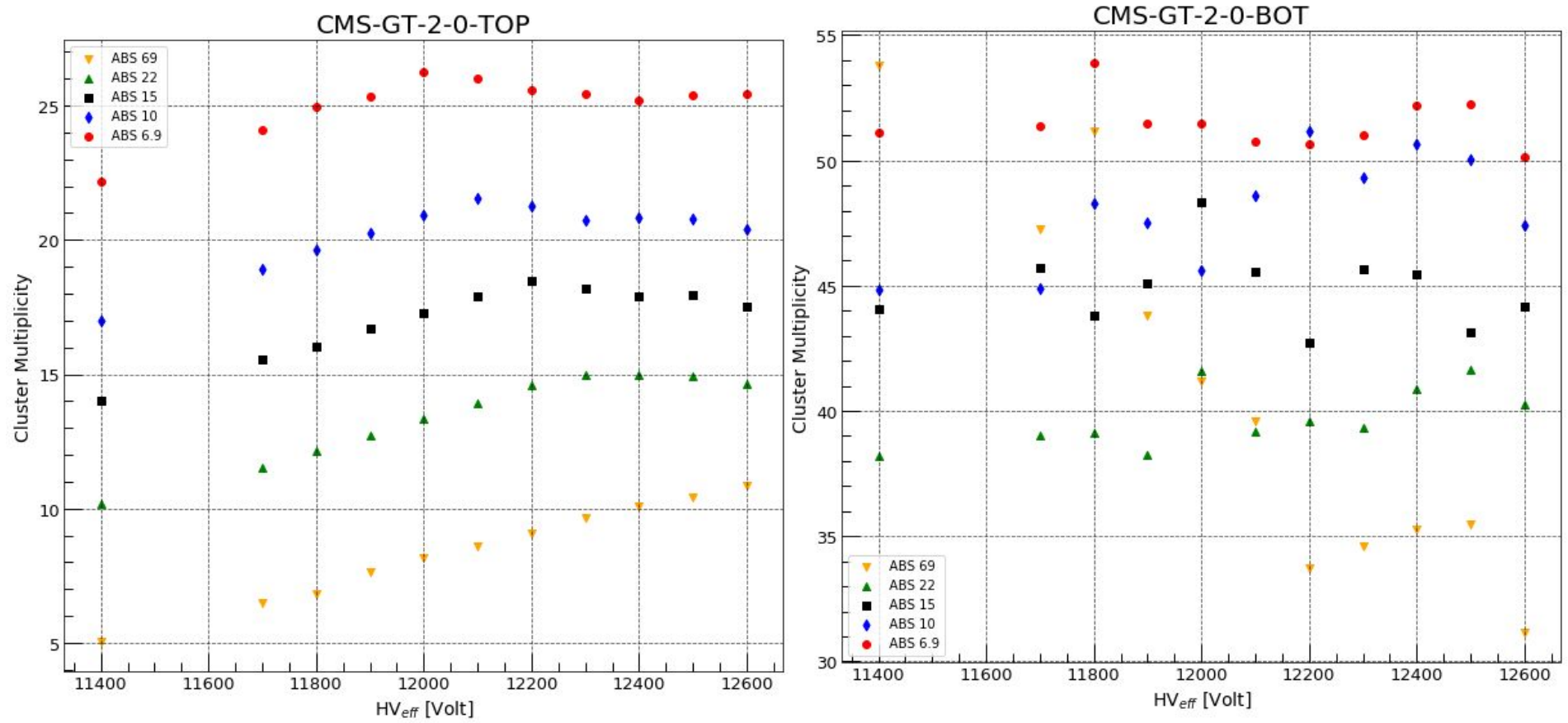
Cluster rate (strip mean noise rate) vs HV with ecogas mix-2@ different ABS



Cluster size vs HV with ecogas mix-2@ different ABS



Cluster multiplicity vs HV with ecogas mix-2@ different ABS



- **Hit profile is not uniform in the case of bottom gap**
- **Current monitored is maximum at 12200V and after the HV point, trend is changing**
- **Cluster/noise rate is more in the case of the second gap**
- **Investigate the cluster multiplicity trend of the second gap**

GIF++ ECOGAS STUDIES

GAS MIX-1: HFO = 45%, CO₂ = 50%, iC4H₁₀ = 4%, SF₆=1

