

PHY 411 Virtual Lab - 1: Find out the operating Voltage of GM Counter

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Roll no: MS18033

Aim: To find the operating Voltage of GM Counter.

Data taken:

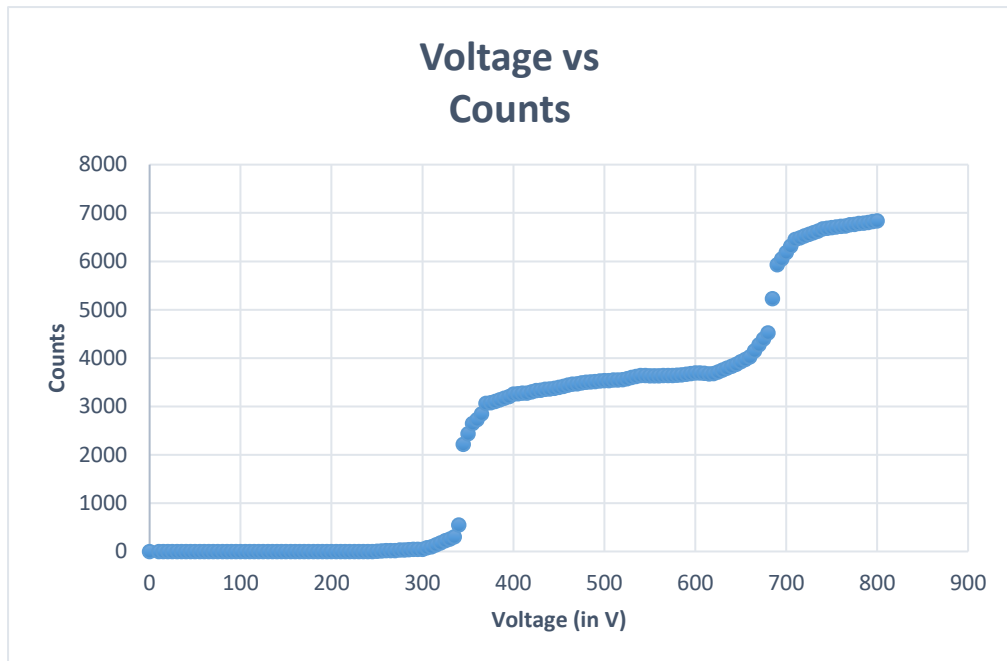
Voltage	Counts
0	0
10	0
15	0
20	0
25	0
30	0
35	0
40	0
45	0
50	0
55	0
60	0
65	0
70	0
75	0
80	0
85	0
90	0
95	0
100	0
105	0
110	0
115	0
120	0
125	0
130	0
135	0
140	0
145	0
150	0
155	0

160	0
165	0
170	0
175	0
180	0
185	0
190	0
195	0
200	0
205	0
210	0
215	0
220	0
225	0
230	0
235	0
240	0
245	1
250	4
255	12
260	17
265	22
270	21
275	32
280	33
285	40
290	43
295	46
300	47
305	79
310	100
315	135
320	176
325	222
330	257
335	304
340	549
345	2219
350	2436
355	2648
360	2726
365	2847
370	3067
375	3079
380	3102
385	3136

390	3167
395	3202
400	3253
405	3264
410	3276
415	3278
420	3305
425	3327
430	3334
435	3355
440	3364
445	3373
450	3398
455	3415
460	3442
465	3461
470	3467
475	3487
480	3502
485	3507
490	3511
495	3525
500	3533
505	3535
510	3547
515	3549
520	3554
525	3575
530	3601
535	3617
540	3637
545	3643
550	3633
555	3631
560	3636
565	3637
570	3643
575	3641
580	3645
585	3656
590	3669
595	3677
600	3695
605	3691
610	3687
615	3676

620	3680
625	3710
630	3755
635	3794
640	3830
645	3872
650	3925
655	3972
660	4023
665	4149
670	4275
675	4395
680	4522
685	5230
690	5933
695	6053
700	6184
705	6314
710	6451
715	6485
720	6524
725	6557
730	6596
735	6628
740	6670
745	6683
750	6698
755	6711
760	6728
765	6735
770	6757
775	6764
780	6785
785	6791
790	6807
795	6823
800	6839

Voltage vs Counts Plot:



Observations and Calculations:

A plateau region is observed in the voltage vs counts plot.

- Starting voltage of plateau, $V_1 = 375 \text{ V}$
- Upper threshold of the plateau, $V_2 = 625 \text{ V}$
- Count at the upper limit of the plateau, $N_2 = 3710$
- Count at the lower limit of the plateau, $N_1 = 3079$
- Operating Voltage = Midpoint of the plateau = $\frac{V_2 + V_1}{2} = \frac{625 + 375}{2} = 500 \text{ V}$
- Slope of the plateau = $\frac{N_2 - N_1}{V_2 - V_1} = \frac{3710 - 3079}{625 - 375} = 2.52$

Results

The obtained value for operating voltage of GM counter is 500 V for a slope of 2.52 of the plateau.

