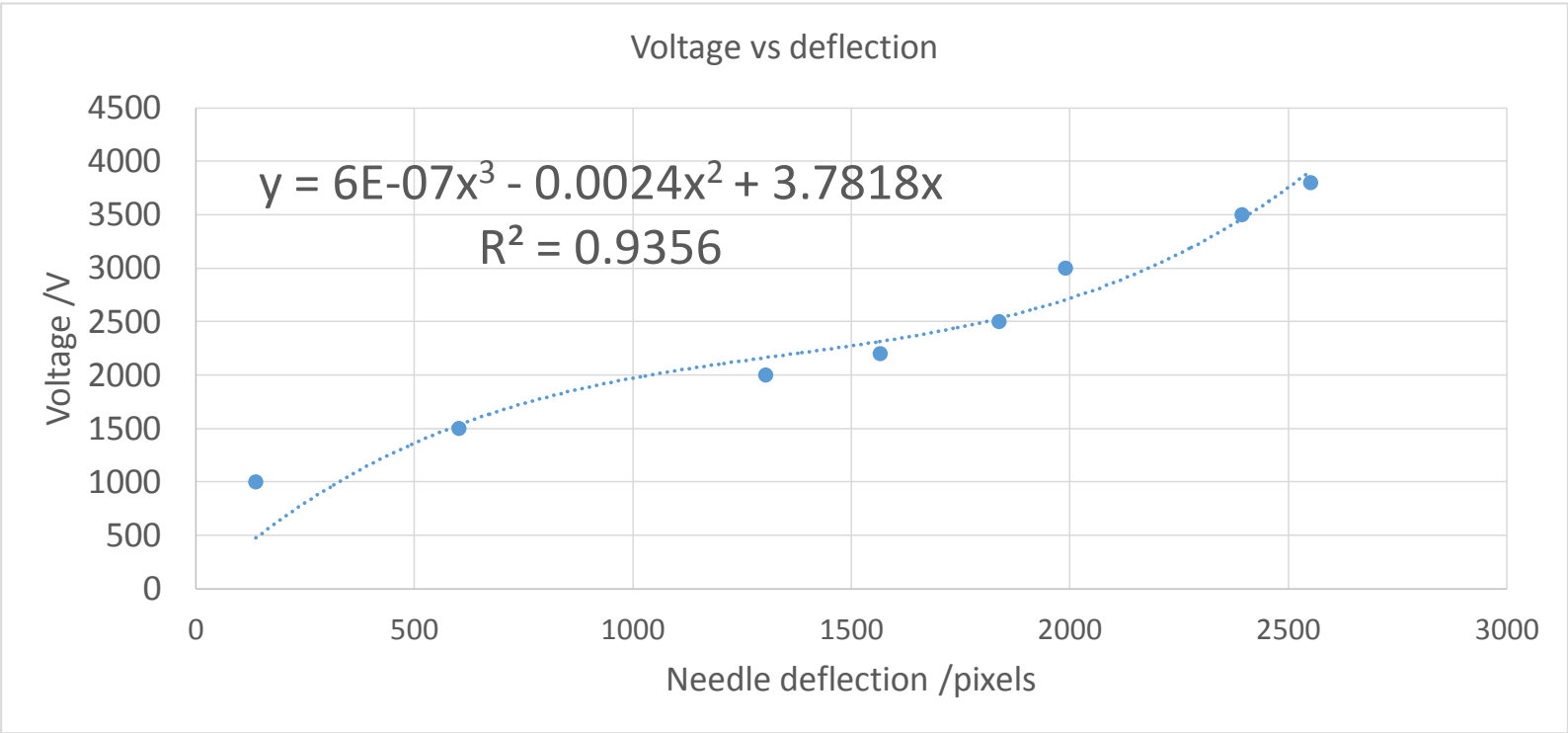


Electroscope calibration 26/9/2019

Supply voltage /V	deflection /pixel from photo
3800	2551
3500	2394
3000	1990
2500	1838
2200	1566
2000	1304
1500	602
1000	137



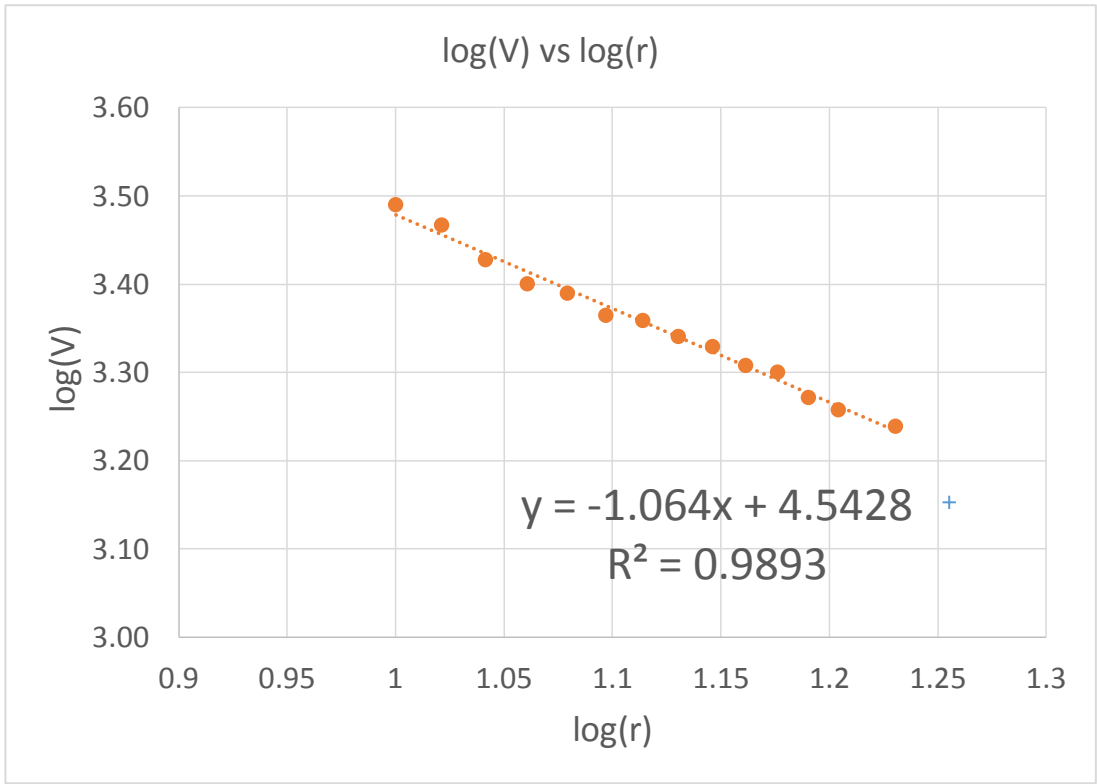
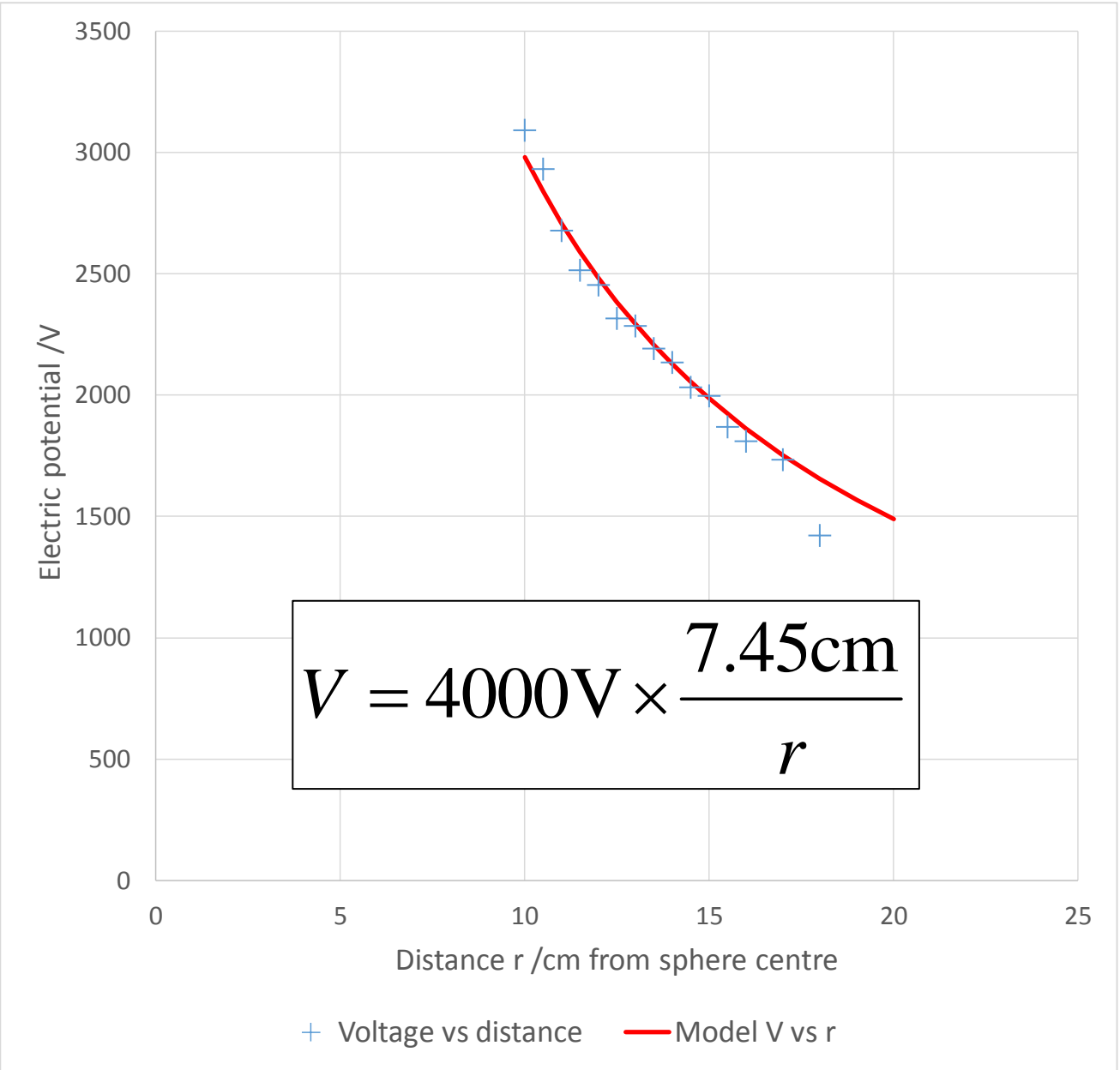
Flame probe experiment

Sphere radius a /cm
7.45

Sphere voltage V0 /V
4000

$$Q = CV_0$$
$$C = 4\pi\epsilon_0 a$$
$$\therefore Q = 4\pi\epsilon_0 aV_0$$
$$V = \frac{Q}{4\pi\epsilon_0 r}$$
$$\therefore V = \frac{V_0 a}{r}$$
$$\log V = \log(V_0 a) - \log r$$

Needle from sphere centre (r) /cm	Needle deflection /pixels	Voltage /V	log r	log V	MODEL V
10	2199	3091	1	3.49	2980.00
10.5	2110	2931	1.021189	3.47	2838.10
11	1934	2677	1.041393	3.43	2709.09
11.5	1783	2514	1.060698	3.40	2591.30
12	1715	2453	1.079181	3.39	2483.33
12.5	1528	2316	1.09691	3.36	2384.00
13	1479	2285	1.113943	3.36	2292.31
13.5	1322	2191	1.130334	3.34	2207.41
14	1225	2134	1.146128	3.33	2128.57
14.5	1067	2032	1.161368	3.31	2055.17
15	1019	1996	1.176091	3.30	1986.67
15.5	870	1869	1.190332	3.27	1922.58
16	812	1810	1.20412	3.26	1862.50
17	745	1733	1.230449	3.24	1752.94
18	531	1421	1.255273	3.15	1655.56
19	318	979	1.278754	2.99	1568.42
20	157	537	1.30103	2.73	1490.00



$$\log(V_0 a) = 4.5428$$
$$V_0 = \frac{10^{4.5428}}{7.45} \approx 4680V$$

Actual voltage was about 4000V