|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DATA | Distance (mm) x | Capacitance (Farads) y | 1/r (1/Distance) | C/(3.14\*Distance\*Distance) |
|  | 7 | 1.5 | 0.142857143 | 0.009749123 |
|  | 8 | 3 | 0.125 | 0.014928344 |
|  | 9 | 4.5 | 0.111111111 | 0.017692852 |
|  | 10 | 6.6 | 0.1 | 0.021019108 |
|  | 11 | 8.7 | 0.090909091 | 0.022898352 |
|  | 12 | 10.3 | 0.083333333 | 0.022779547 |
|  |  |  |  |  |
| Fit -> | 1.252380952 |  |  |  |
|  |  |  |  |  |
| LINEST OUTPUT |  |  |  |  |
| Slope -> | 1.805714286 | -11.38761905 | <- y intercept |  |
| Uncertainty -> | 0.060090634 | 0.58001212 | <- uncert. y-int |  |
| R^2 -> | 0.995589824 | 0.251377159 | <- Variance |  |
| Fisher -> | 902.9932178 | 4 |  |  |
|  | 57.06057143 | 0.252761905 |  |  |
| |  | | --- | |  | |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

A1. Yes, the values are reasonable. This is further reinforced by the R^2 value approaching 1.

A2. I calculated the average capacitance to be 1.76. | 1.76 – 1.80 | = 0.4 = t . I suspect that the error comes from environmental electro-magnetic “noise”. I also suspect that the data might be a little more accurate if the distances were shifted from 6mm – 11mm. The C/Area formula data suggests that some kind of “local max” is reached at approximately 11mm . Is this the limit of the “Gaussian surface”?