Errata – An Affordable Particle Detector for Education

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- Undefined citations on pages 2 and 29 should refer to [30]
- Histogram for budgets should include the ranges rather than single values as bin labels (i.e. £0–£49, £50–£99 ...) and subsequent analysis should be adjusted similarly
- At foot of page 3, should read '... have access to power supplies of 4kV or over ...' (*not* 5kV)
- Figure 7 should explain that lower line is for ions and upper line is for electrons
- The caption for figure 9 should read 'The development of a streamer in time[15] (a) initial avalanche, (b) polarisation effects of avalanche – limited proportionality, (c) secondary avalanches due to photoionisation, (d) early streamer, (e) developed streamer'
- The passage under section 4.3 starting 'The resistive coating ...' should read 'The resistive coating helps localise the charge before it is dissipated'
- Figure 12 should explain that the size of the circles represents the magnitude of the charge reaching the HV electrodes.
- The sentence that starts 'We ±7kV ...' should read 'We used the ±7kV ...'
- Figure 16 should specify that dimensions are in mm
- The inverted question mark in the first bullet point on page 23 should be a greater than symbol
- Figure 19 caption should state that the drying period was 14 days, *not* 15
- Figure 22 caption should explain that the jump in tinned results is most likely due to a contaminant between the aluminium electrodes and the ink surface such as a bit of grit and so was ignored
- Sentence at the foot of page 26 should read, '... the larger the square the more resistive it is' *not* '... the more conductive it is.'
- The y axis labels for figures 19, 20, 21, 22 and 23 should read 'Resistivity (kΩ/square)'

- The last paragraph in section 5.5 should be altered to read 'We chose not to experiment with Jerry-Beth...'
- Section 5.7.1 should be removed
- The first sentence in section 5.8 should read 'Initially the readout system would spark under voltages of around 1kV, tripping the HV unit.'
- The third sentence in section 5.8 should read 'We replaced the wire taking the HV fron the SHV socket to the PCB inside the aluminium box with a shorter, less flexible length of wire that would not rest against the walls of the box...'
- The noise analysis in section 5.12.1 is wrong. The actual rate of noise is given by a much simpler formula

$$N_{\mathrm{RPC}} = \frac{N_{\mathrm{A+B+RPC}}}{N_{\mathrm{A+B}} t_{\mathrm{coincidence}}}$$

  where N_{RPC}, $N_{\mathrm{A+B+RPC}}$, $N_{\mathrm{A+B}}$ are the rates of RPC counts, triple concidence counts and scintilator coincidence counts respectively. $t_{\mathrm{coincidence}}$ is the coincidence time. Assuming coincidence time of 70nS we get noise signal counts of the order of 10^6 rather than 10^3. The noise/signal crossover now occurs at less that 70mV threshold, however at 70mV noise contribues around 50% at 80mV threshold, less than 0.03%. Therefore the limit should be set at 80mV *not* 90mV. However, this does not affect final results greatly.
- Capacitance calculated for readout strips done in error, should be 566nF caculated by assuming for the two layer of dielectric, two capacitors in series.
- Second paragraph in section 5.11.2 should mention that we also calculated the effective area as being the size of the HV electrodes since discharges could still be picked up there, it was calculated as $55.8 \pm 1\%$. This gave us a range of efficiencies which is shown in figures 31 – 35.
- It should be explained in the results section that the curves on the graphs are fit to data rather than theoretical fits
- The costs in the table in section 7.3 should be marked in pounds sterling
- Appendix D.2 should mention that it is the beginnings of a model for determining the energy deposited in the RPC. Future version would assign each 'particle' with a random energy according to the energy distributions given in reference [13]