

Charge analysis for Fall 2016

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1 Charge comparison by different BCMs'

We extracted the charge from different BCMs by using the co-efficient from Nov 2 for runs before vacuum incident (14523) and used the gain from Nov 26 for the runs after vacuum incident. The run for this analysis are taken randomly. Figure 1, shows the ratio of charge by different BCMs to D3 as the function of run number. The gap in run number is because of vacuum incident. The shaded region in the graph shows within $\pm 1\%$. U1 and D1 are excluded from analysis for beam current $10 \mu\text{A}$ or less. This plot shows that the BCMs are in agreement within $\pm 1\%$ with D3, beside few outliers. Dnew near 14500 are off by 1.5% and gets back to normal later. We did similar analysis by using the combined gain from Nov 2 and Nov 26. Figure 2, shows the result for comparison of charge by different BCMs with D3. The plot looks better for D10 and Unew especially after vacuum incident runs they are in agreement with D3 below 0.5%. However, the new receiver doesn't quite well agrees for runs before vacuum incident. On the other hand U1 and D1 also doesn't fit well within $\pm 1\%$ as in figure 1. Figure 3, is simply the zoomed version of figure 2, which shows that D10 and Unew are agreement with D3 within 0.4% for the runs after the vacuum incident.

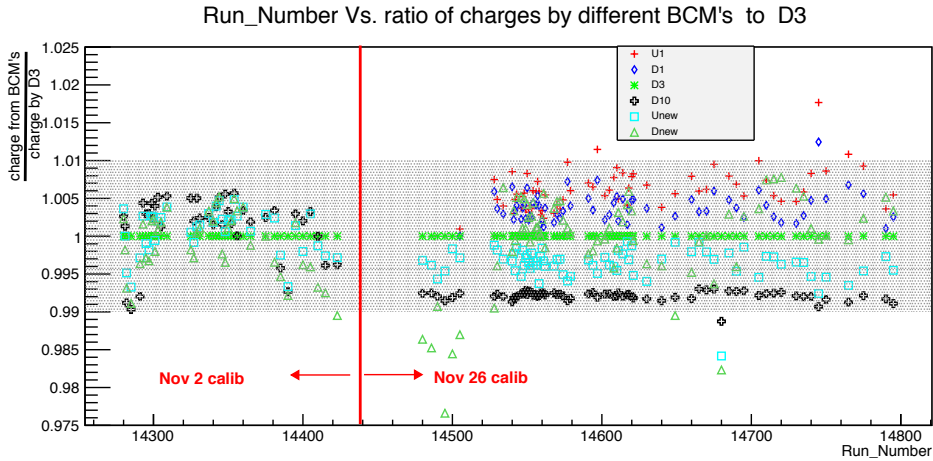


Figure 1: Charge comparison by different BCMs. For runs before vacuum incident the gains from Nov 2 are used while for the runs after vacuum incident the gains from Nov 26 are used. The shaded region shows within $\pm 1\%$. All the BCMs agrees with D3 within 1%. However for few runs around 14500 the Dnew is off by $\sim 1.5\%$.

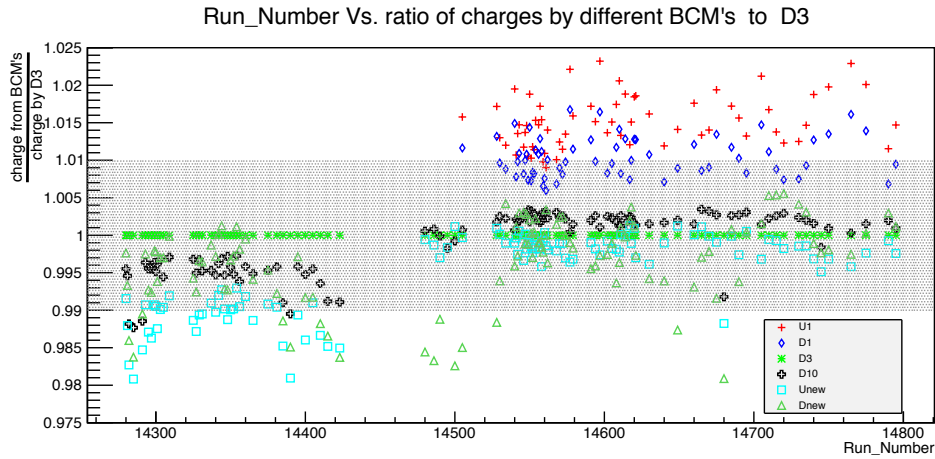


Figure 2: Charge comparison by different BCMs using the combined coefficient from Nov 2 and Nov 26 calibration. D10 and Unew looks better as compared to above plots, they are in well agreement with D3, less than 0.4%. However U1 and D1 gets worse so does the new receivers for the runs before vaccum incident.

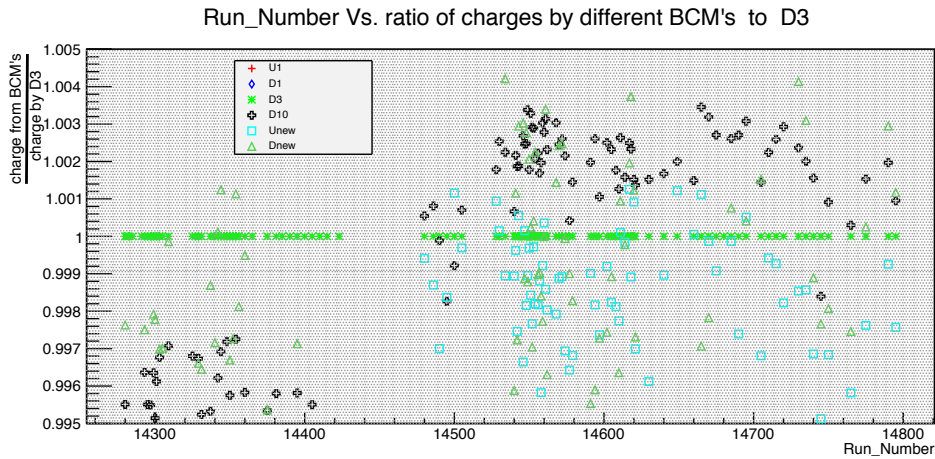


Figure 3: Charge comparison by different BCMs. This is the zoomed plot for figure 2. It basically shows using combined coefficient the charges measured by D10 and Unew agrees within 0.4% with D3.

1.1 Charge dispersion

We extracted the ratio of charge by different BCMs to charge by D3, for the different runs using the combined coefficient and coefficient from Nov 26. This analysis was done for the for runs after vaccum incident. Figure 4, shows that the dispersion of charge for different BCMs using Nov 26 calibration coefficient, while fiure 5 shows the dispersion of charge using the combined coefficient.

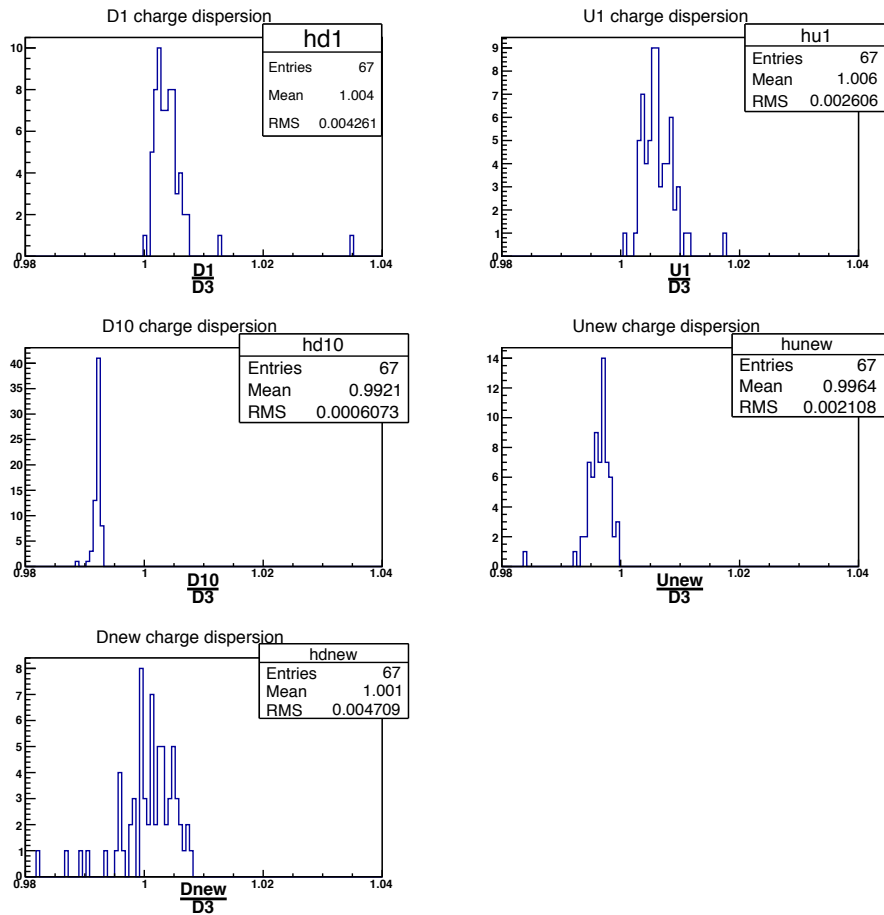


Figure 4: Dispersion of charge by using calibration coefficient from Nov 26.

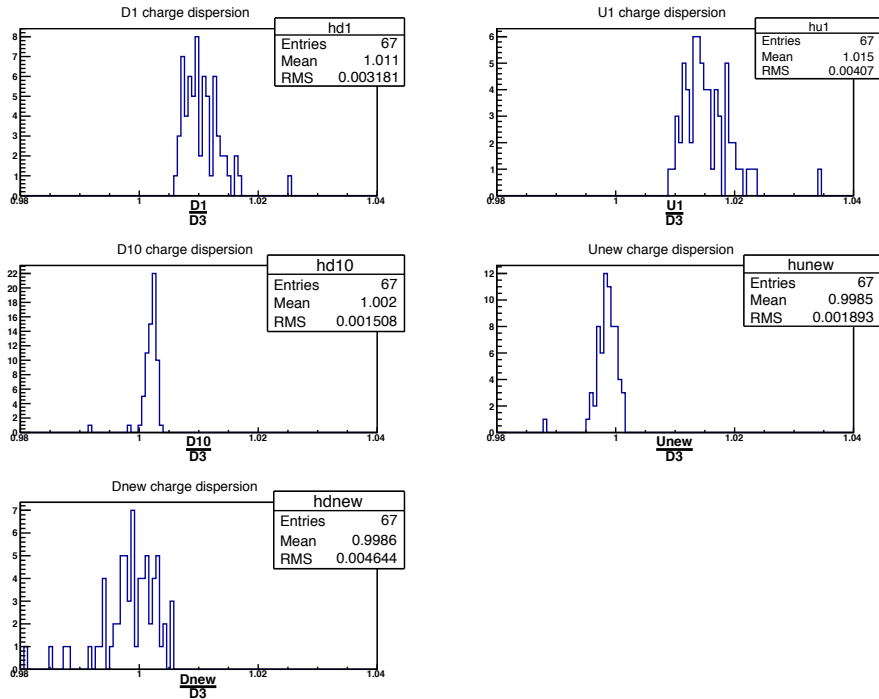


Figure 5: Dispersion of charge by using combined calibration coefficient from Nov 2 and Nov 26..

1.2 Linearity check for Unser

We have plotted the frequency for different BCMs along with the frequency of D3. It looks like U1 vs D3, D1 vs D3 looks linear but for new receiver the plot looks weird. At this point I am not sure about the information we could extract from this plot.

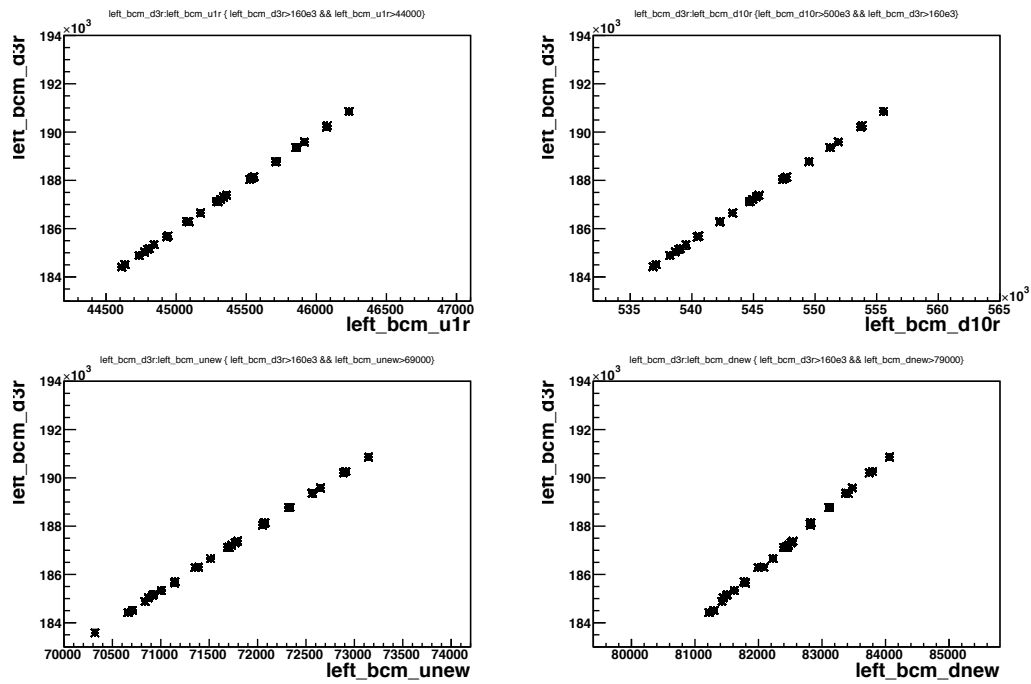


Figure 6: