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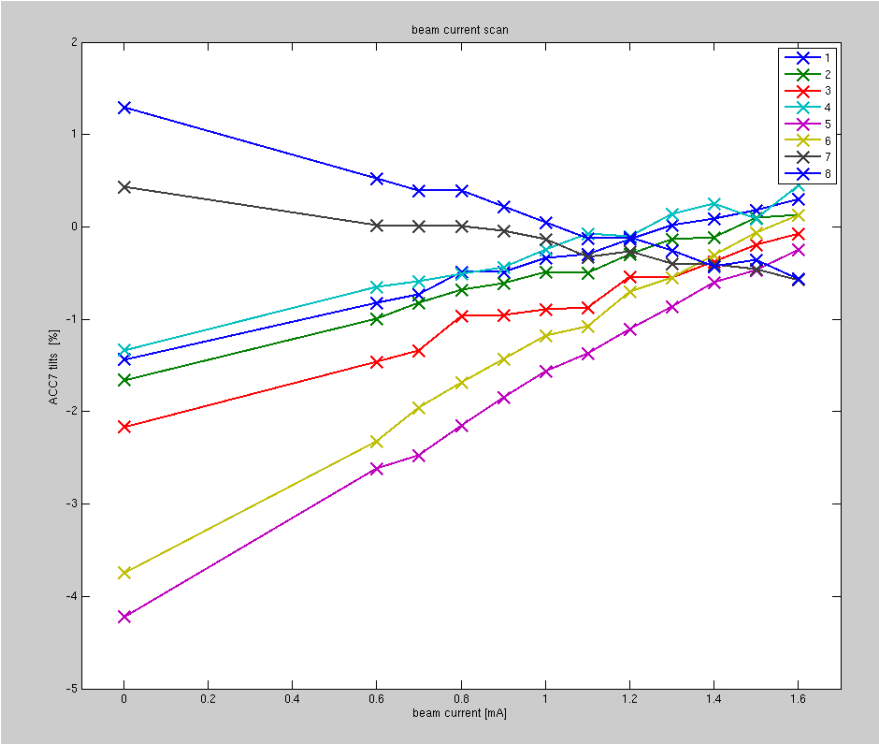
Night shift Feb 6th

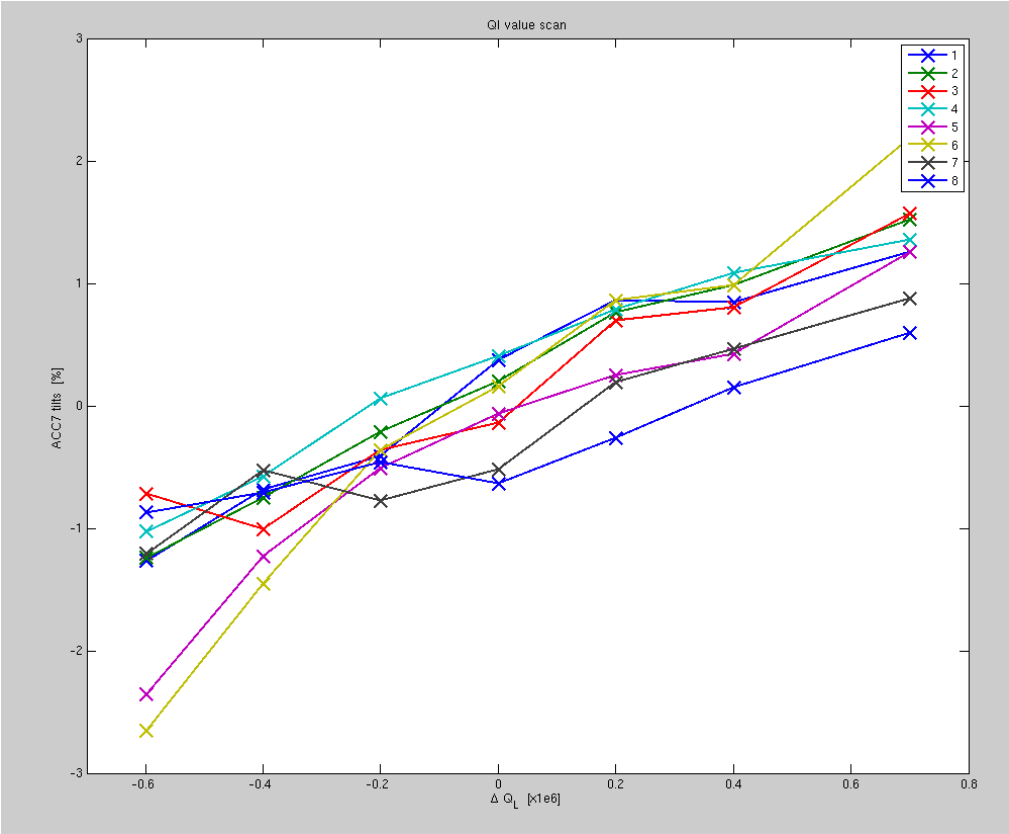
We worked with ACC67 at 183.5MeV. First we restore the setup of Feb 5th. Then we used the simulator to calculate optimal Ql values and applied them all at the same time. The tilts decreased but some tuning of cavity detuning and also couplers had to be manually adjusted. Clearly flattening gradients in ACC7 is easier than ACC6. So, to save time we decided to do the current and Ql scans using ACC7.

The beam loading scan was done varying the charge from 1.6nC down to 0.6nC plus 0nC. The plots show a linear increase in the tilt as we move away from the optimum in both directions.

From the plot, it is interesting to see that we actually had the machine optimized for 1.5nC, not 1.6nC. This somewhat quantifies the limit in accuracy of the optimization setup. One can assume that the optimization is good to +/- .1nC. A computational approach to produce the optimal Qls (as opposed to the graphical approach we have been using tonight) could help increase the accuracy of the optimization. Another limitation is the accuracy of setting the Qls. Most of the time, we were able to set the Ql's with an accuracy of +/- 0.05e6 form the desired value. From the plot, it is interesting to see that we actually had the machine optimized for 1.5nC




We then restore the beamloading back to 1.6nC, and scan QL up and down from the optimum value, in constant steps of 0.2e6. Again all cavities behave linearly around the optimum value and 0% tilt.




We retuned the machine to its original state (i.e. brought all Qls to the initial value of ~3e6 and adjuted detuning).