Klystron saturation studies:
Options for changing relative fill and flat-top power..?

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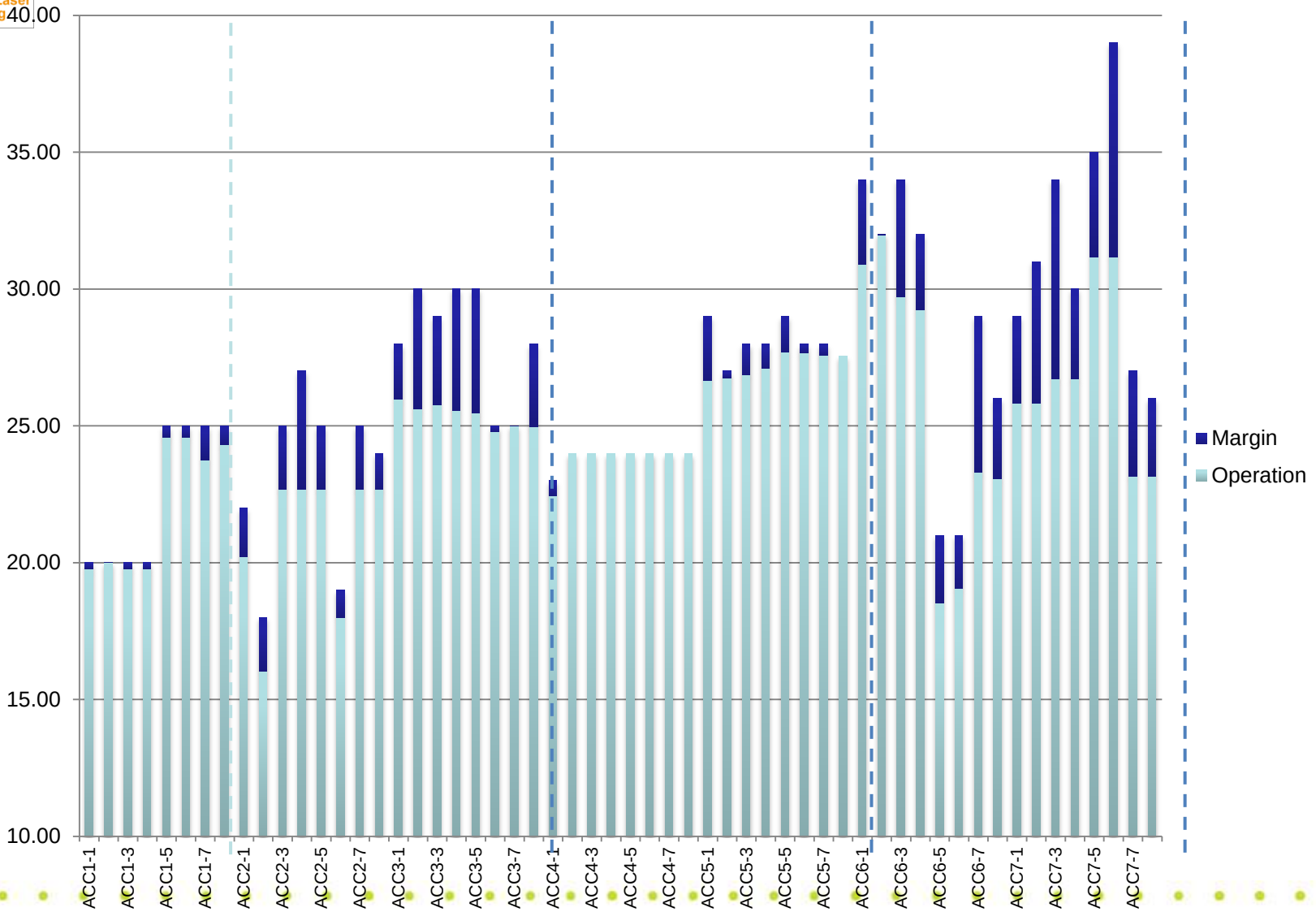
Some ideas for changing parameters for increasing relative flat-top power (ACC67)

Option	Pro	Con
Increase beam current	It's the obvious one – we'd need ~5.5mA	• Gun conditioning? • Beam transport issues
Increase fill time	Reduces fill power	• Already did that in Feb – ran out of room with the timing configuration (NO)
Lower the average QL	Lower Ql = shorter fill time for same gradient, or lower fill power for same fill time	• Still need to use spread of QLs to maintain flat gradients with beam loading so we don't hit quench limits • Matched current scales with 1/QL, so we need proportionately more flat-top power
Dynamically detune the cavities at end of fill the piezos (or don't compensate LFD)	Needs more flat-top power (what we want)	• Practical? Can we dynamically change the Ql fast enough using piezos??

Operational gradients



Options (cont)

Option	Pro	Con
Raise average QL	Matched current scales with 1/Ql, so flat-top power goes up even though gradients are lower	• Fill time becomes longer for same gradient or gradient is less for same fill power • Still need spread of Qls to avoid gradient tilts
Use ACC45 instead of ACC67	ACC4 cavities on run at identical gradients, so no spread of QLs needed, ACC5 cavities have lower spread then can lower average Ql to reduce fill time	• Can we reach klystron saturation? • Operational issues? • Do we gain enough? • Problem – stub tuners not motorized couplers on ACC45