Descriptions of slides

Slide 1 (the next slide)

ACC6 and 7 gradients with 9mA of beam, cavities are tuned according to SLAC approach (i.e. Pk's and Ql's adjusted to be flat with 9mA of beam). (Note: in practice, we would not be able to adjust the relative Pks.)

Slide 2:

Column 2: ACC6 and 7 operational gradients currently used at FLASH.

Column 3&4 : QL and Pk settings derived from the SLAC approach to achieve flat gradients on all cavities with 9mA beam current at the gradients in Column 2 and using a fill time of 460us.

Column 5 : tilt that one should expect going from 9mA to 0 mA.

Slide 3:

ACC6 and 7 with 0 mA of beam (nothing was changed from slide 1 except the beam was turned off)
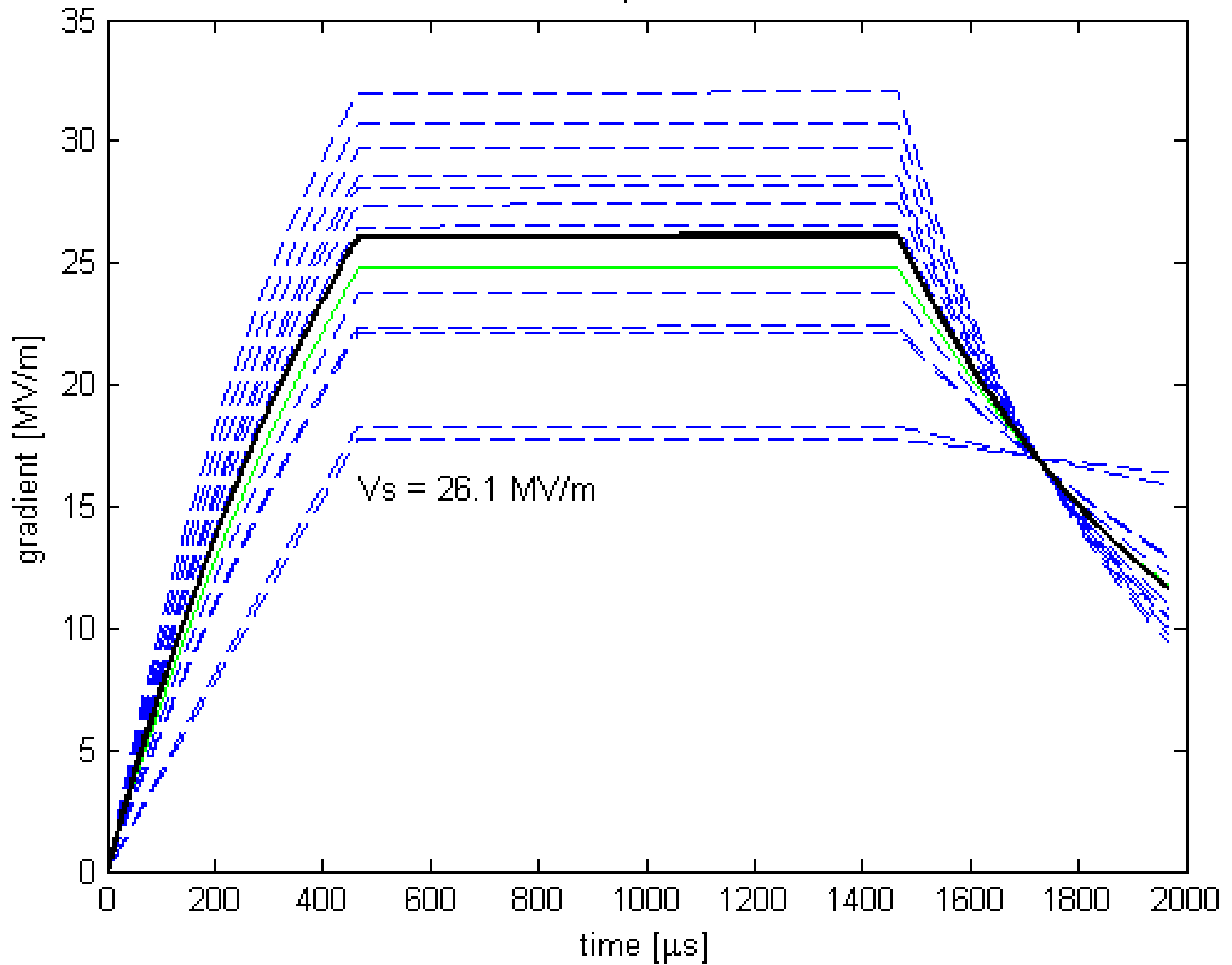
Slide 4:

Maximum tilt in ACC6-7 as a function of beam current (if we stick to SLAC tuning and to the full flat top length)

Slide 5

Equations to predict QL and PK for all cavities for the SLAC approach, along with the graph explaning extreme QL settings for a wide spread of cavities.

*Reference file for FLASH HLRF configuration: flash_wg_20100214.xls*

Amplitude

Vs = 26.1 MV/m

ACC6

Cavity	Eacc [MV/m] [*]	QL [x10^6] [†]	Pk [kW] [†]	Tilt [MV/m] [‡]
1	29.77	1.9	301	-5.6
2	30.81	1.8	320	-6.6
3	28.63	2.0	282	-4.5
4	28.18	2.1	275	-4.0
5	17.84	25.4	621	15.6
6	18.36	14.5	397	13.8
7	22.45	3.7	218	3.7
8	22.23	3.8	218	4.1
	E_{AVE} = 24.8 MV/m		P_{TOT} = 2.63 MW	

ACC7

Cavity	Eacc [MV/m] [*]	QL [x10^6] [†]	Pk [kW] [†]	Tilt [MV/m] [‡]
1	26.56	2.3	251	-2.2
2	26.56	2.3	251	-2.2
3	27.47	2.2	264	-3.3
4	27.47	2.2	264	-3.3
5	32.05	1.7	344	-7.7
6	32.05	1.7	344	-7.7
7	23.81	3.1	224	1.5
8	23.81	3.1	224	1.5
	E_{AVE} = 27.5 MV/m		P_{TOT} = 2.16 MW	

* From FLASH waveguide distribution 2/14/2010 (flash_wg_20100214.xls)
† From "RF Distribution Optimization in the Main Linacs of the ILC", Bane, Adolphsen, Nantista - WEPMS037.pdf
‡ tilt due to a change to no beam current without readjusting Q_L's and P_K's

Amplitude

Vs = 26.1 MV/m

a cavity has quenched!!!
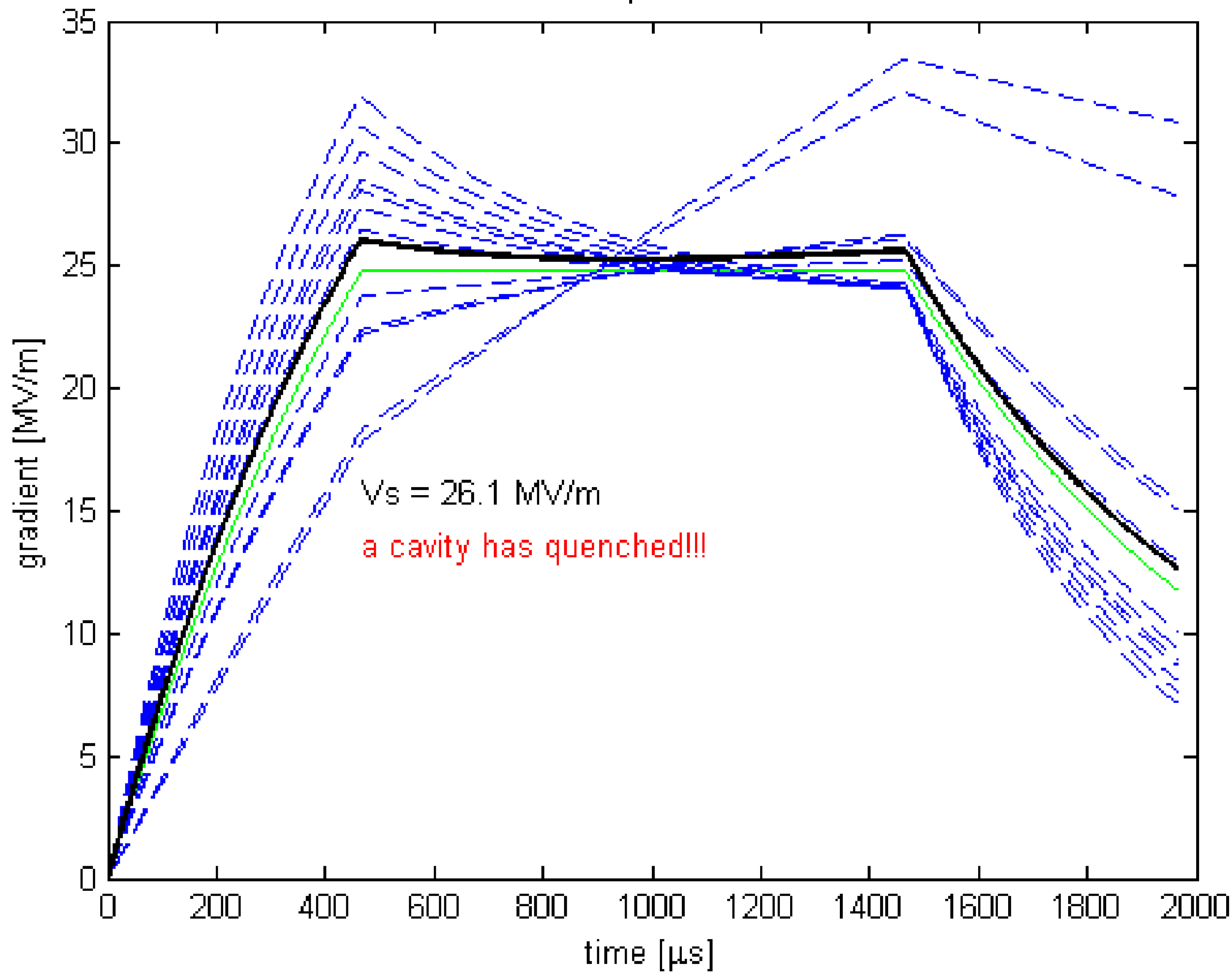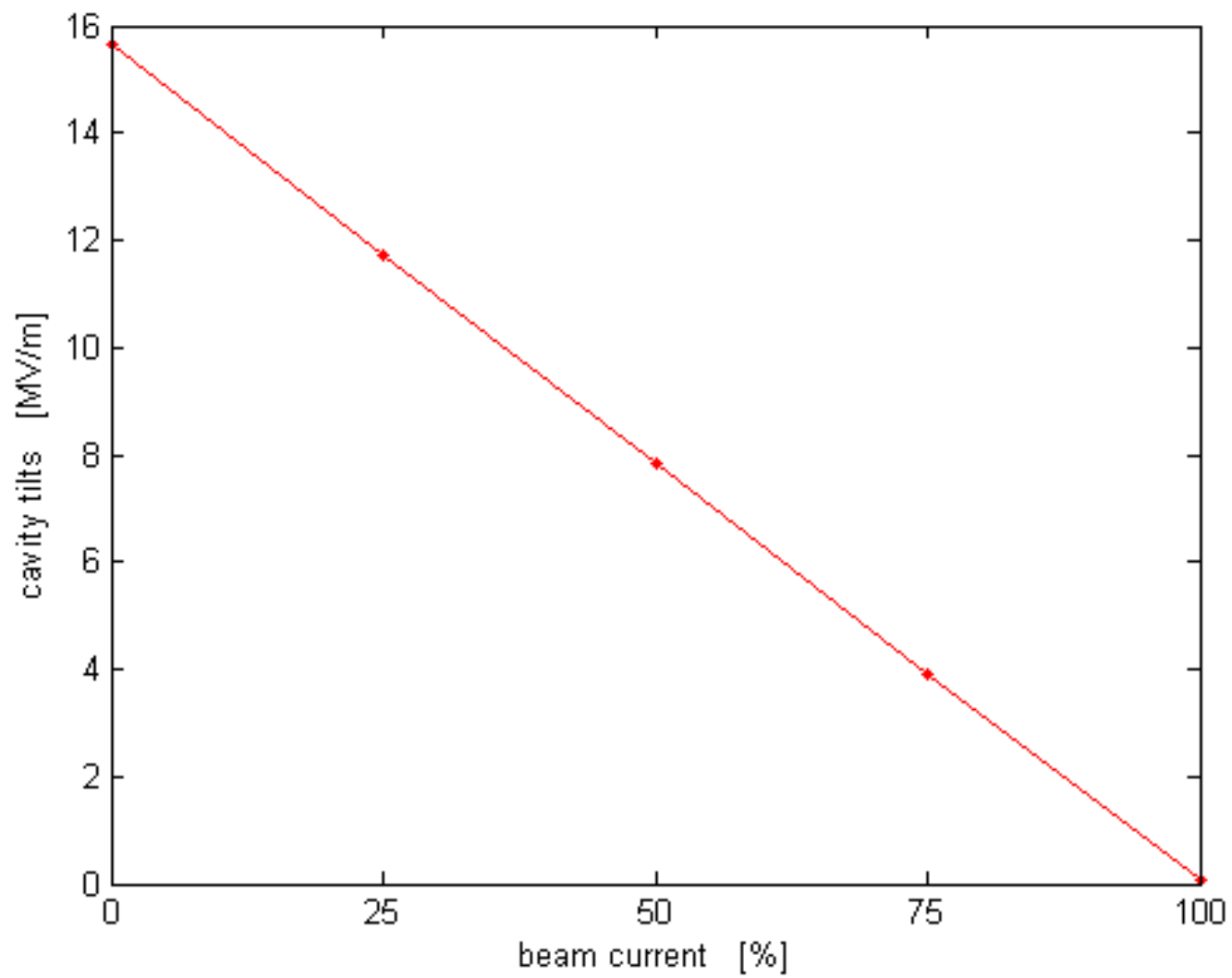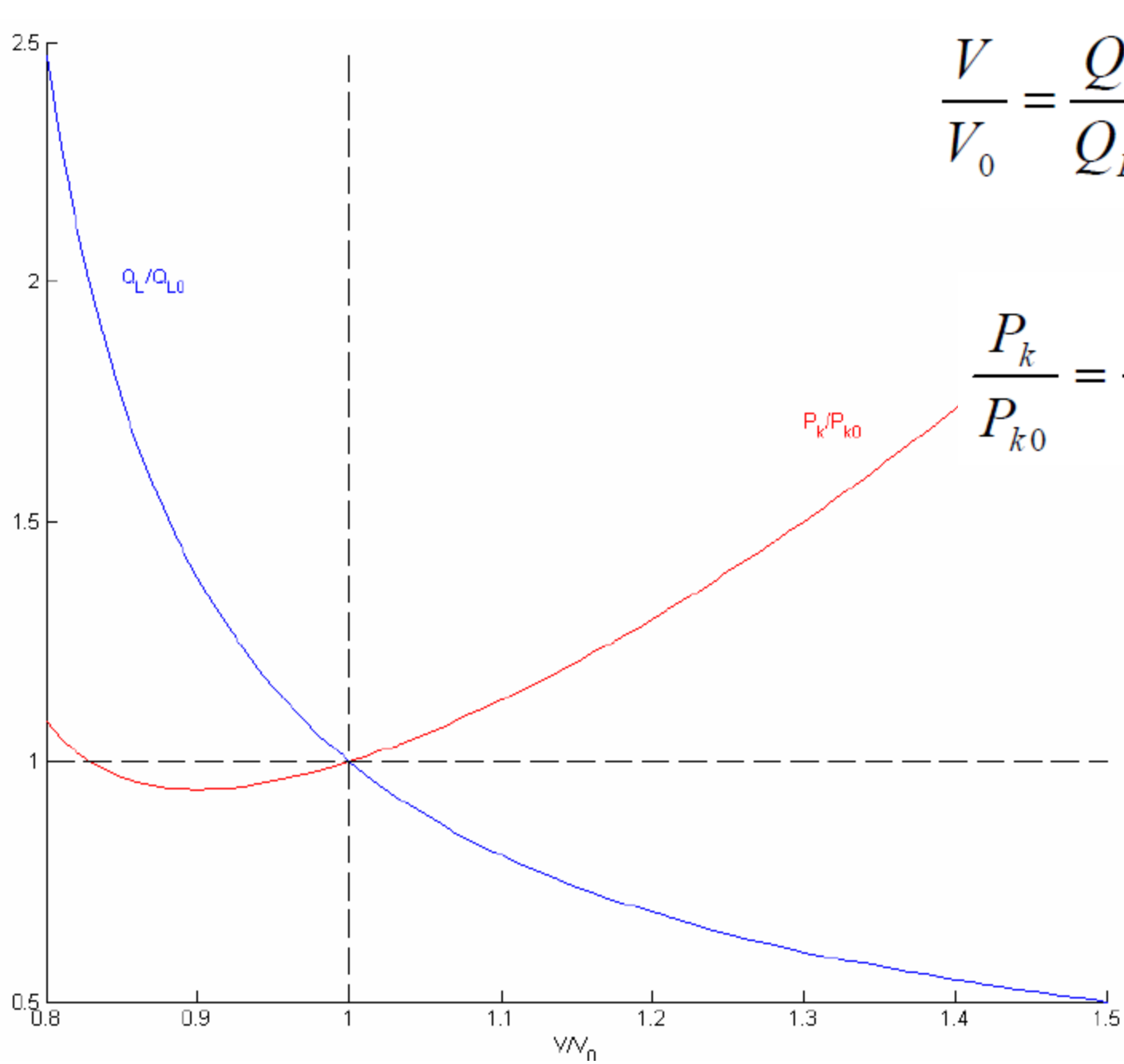
$$\frac{V}{V_0} = \frac{Q_L}{Q_{L0}}\left(2^{\frac{Q_{L0}}{Q_L}} - 1\right)$$

$$\frac{P_k}{P_{k0}} = \frac{Q_L}{Q_{L0}} 4^{\left(\frac{Q_{L0}}{Q_L}-1\right)}$$