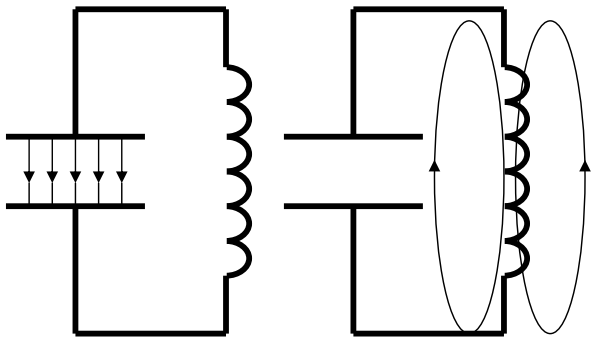
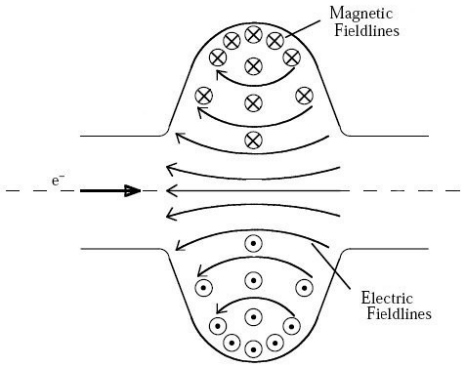
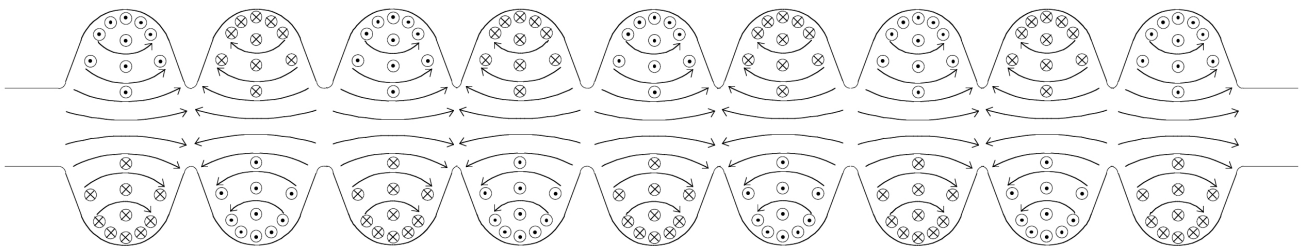
REU 2009
Welcome to
Cornell!

D. Meidlinger

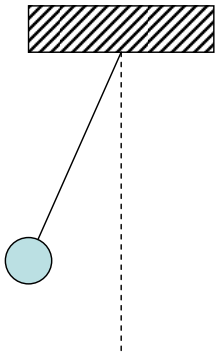


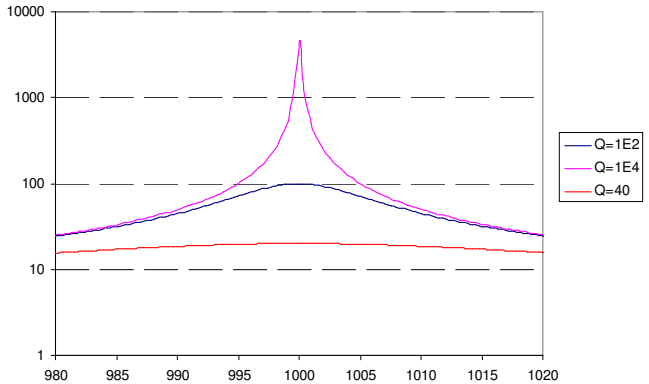




REU 2009
Welcome to
Cornell!

D. Meidlinger





$$Q = \frac{\omega U}{P_d} = \frac{\text{stored energy}}{\left\langle \frac{\text{dissipated energy}}{\text{radian}} \right\rangle}$$

$Q \approx$ number of oscillations until U is zero.

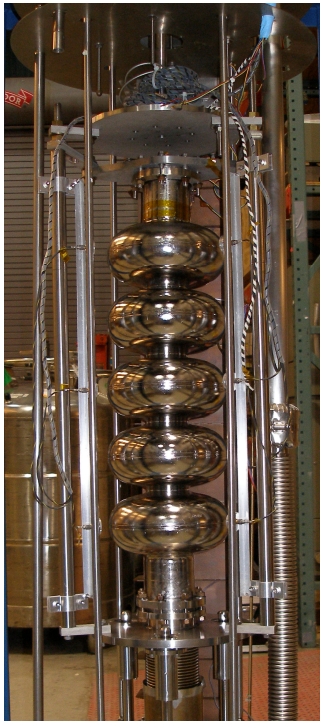
For $f = 1$ Hz and $Q = 100$, oscillations cease in 1 minute 40 seconds: If $Q = 10^{10}$, then 317 years!

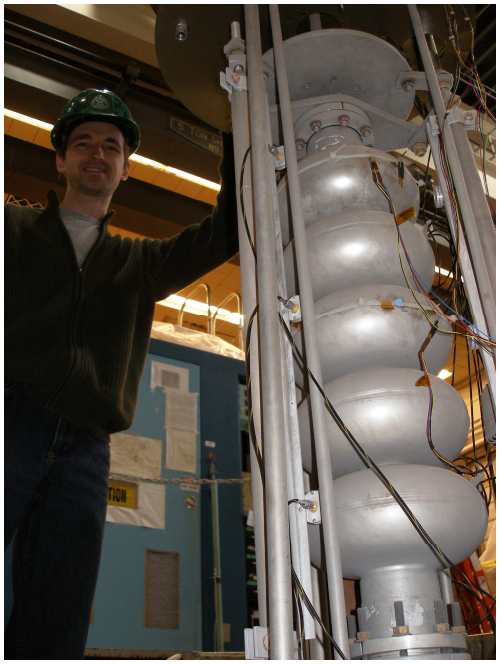
$$Q = \frac{f_0}{\Delta f}$$

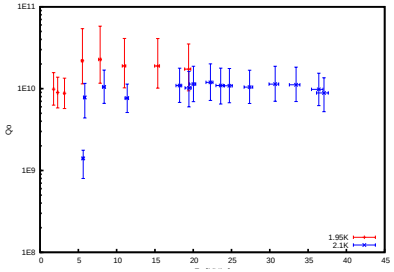
For $f_o = 1.3$ GHz and $Q = 10^{10}$, $\Delta f = 0.13$ Hz. Nanometer-scale vibrations can move the resonance!

REU 2009
Welcome to
Cornell!

D. Meidlinger







A phase-locked-loop maintains a constant phase differnece between the cavity and RF source.