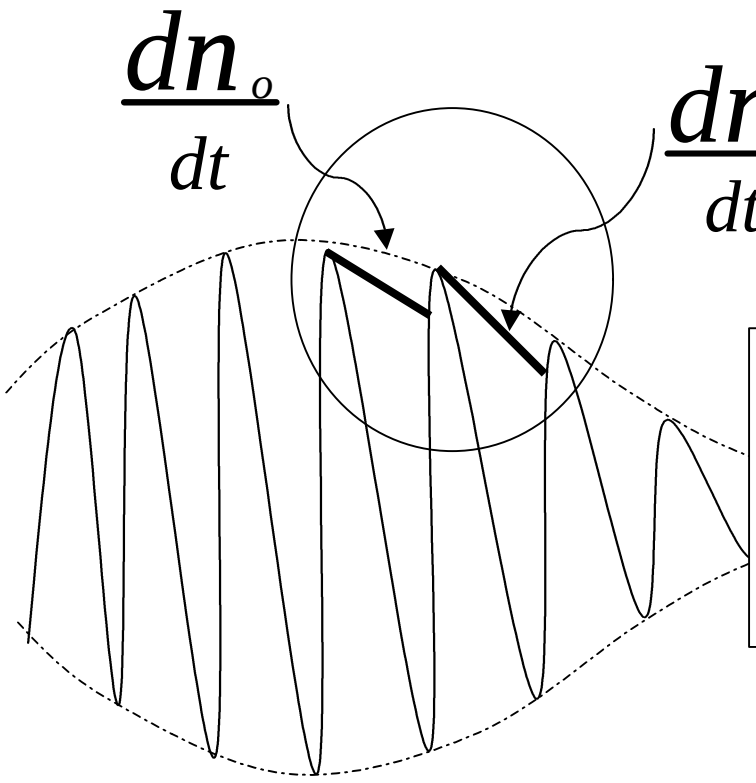
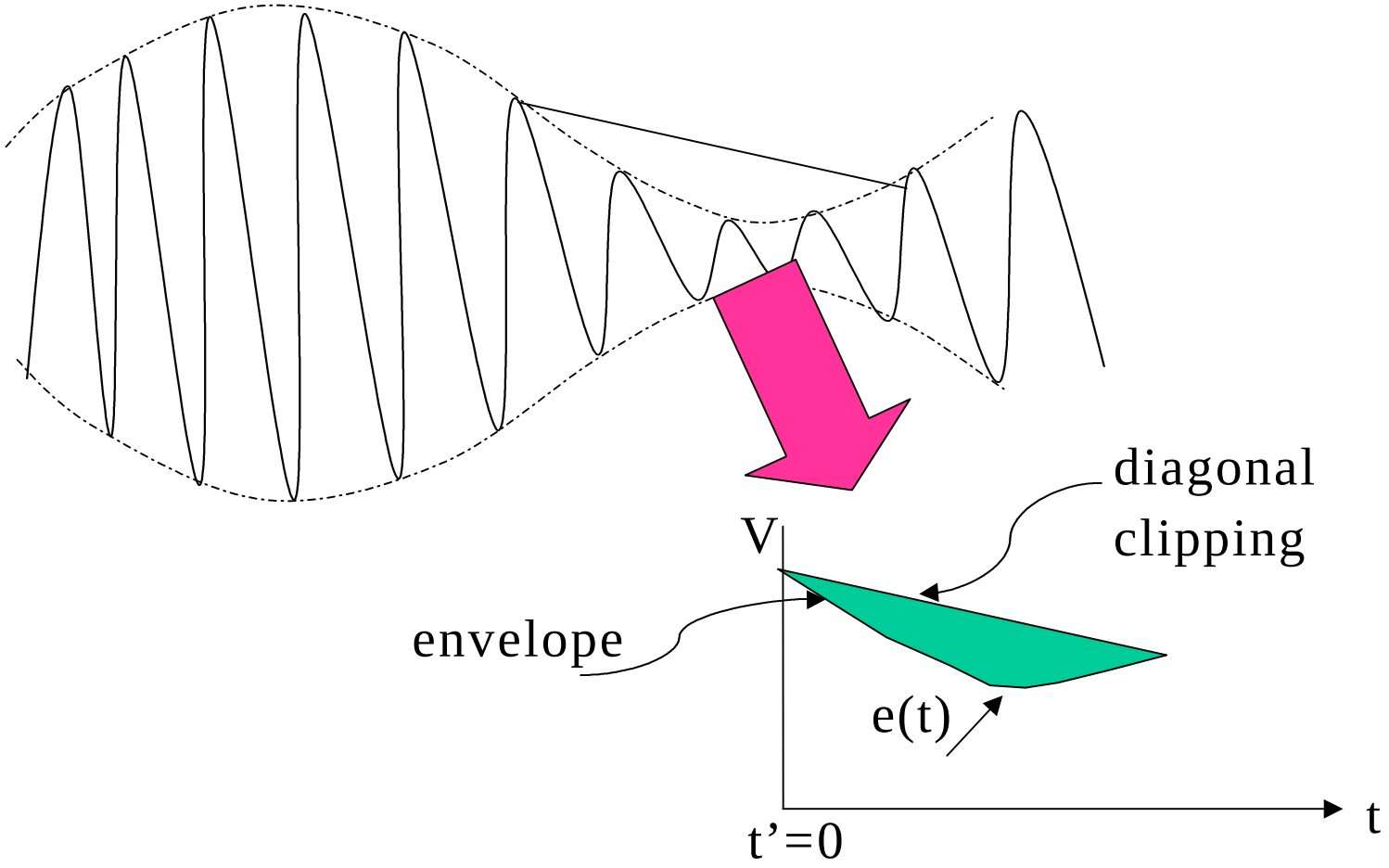
About “Peak Detection” and Waveforms



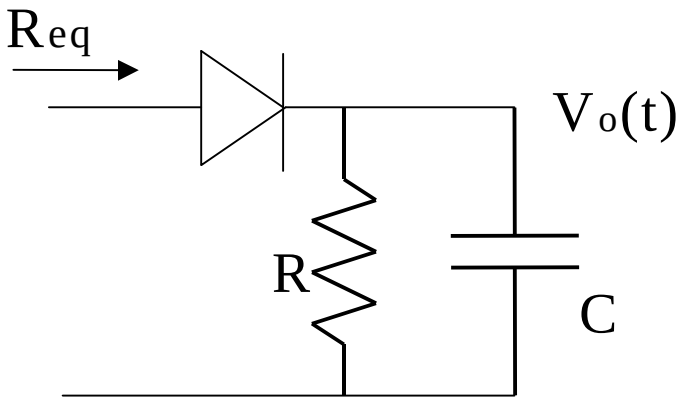
Generally..we..want :

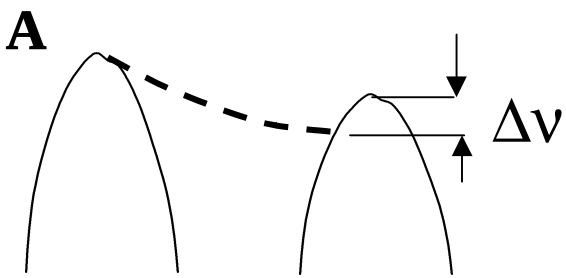
$$\left|\frac{dn_o}{dt}\right| \geq \left|\frac{dn_i}{dt}\right|$$

What we DON'T want--Clipping



Condition for Optimum RC





"refresh" needed from next phase pulse, via diode

$$T_{w_c}$$

$$\frac{1}{w_m} = RC \cdot \frac{1}{\sqrt{\left(\frac{1}{m^2}\right) - 1}}$$

$$T_{w_m}$$

About the Equation for “optimum”…

$$v_i = V_i(1 + m\cos w_m t)$$

$$v_o = Ve^{-\frac{t}{T_{RC}}}$$

$$\frac{V}{T_{RC}} e^{-\frac{t}{T_{RC}}} \geq V_i m w_m \sin w_m t$$

$$equating\_v_i = v_o\_(at\_some\_t)$$

$$\frac{1 + m\cos w_m t}{T_{RC}} \geq m w_m \sin w_m t$$

And the answer is…

after_some_"trig"_manipulations...

$$\frac{\left(1-m^2\right)^{\frac{1}{2}}}{m} \geq w_m T_{RC}$$

where $T_{RC} = RC$ *_then :*

$$C \leq \frac{\left(1-m^2\right)^{\frac{1}{2}}}{m} \frac{1}{w_m R} = \frac{\sqrt{\frac{1}{m^2}-1}}{w_m R}$$

The KEY equation for C (in terms of:m,ω_m &R)