Choices for high Q circuits

1. \( Z_L > R \) Series \( R \leq Z_0 \)
2. \( Z_L < R \) Mixed (Both Parallel, \( R > Z_L \))

Topology of Resonance

1. Pure Series \( R \leq Z_L \)
2. Pure Parallel \( R > Z_L \)
3. Mixed: \( R \leq Z_L \)

Special Purpose

\( R = 0 \) (\( V_3 \)) \( R = 0 \)
Fig. 9 - Resonant Mode Loading

A. SERIES LOADING (current output)

\[ R_i > \sqrt{\frac{E}{3}} \]

B. PARALLEL LOADING (voltage output)

\[ R_i < \sqrt{\frac{E}{3}} \]
Flourescent Light: \( f \) -

How to get \( V_{\text{off}} \) large, \( V_{\text{on}} \) small

"naturally" via resonant circuit

\[
\begin{align*}
V_{\text{in}}(f) & \uparrow \quad L \quad C_s \\
\downarrow & \quad \frac{1}{C_p} \\
& \quad f_R \quad (\text{light off}) = \frac{1}{\sqrt{L C_{\text{eff}}}} = f_{\text{high}} \\
& \quad \text{smaller than } C_p \\
& \quad f_R \quad (\text{light on}) = \frac{1}{\sqrt{L C_s}} = f_{\text{low}} \\
V_{\text{in}}(f) & \quad \text{near resonance} \\
& \quad V_c \approx Q V_{\text{in}}
\end{align*}
\]
Sweep \( f \) starting \( f > f_h \)

\[ f = f_h \quad V_{cp} \text{ is max} \]

CFL breakdown shorts \( C_p \); circuit moves to red

\( f_h \) curve \( V_{cp} \) ↓
LCC Resonant Supply

- Plasma Load
- LCC resonant network
- Resonant Engine

Phase connections
Voltage Gain - Resonant supply with LCC tank (Resistive load)
Interleaved ZCT converter operation (ideal waveforms)

Transition interval:
\[ t_1 = \frac{I_0 L_0}{I_{\text{in}} (L_1 + L_2)} \]

Diode recovery slope:
\[ V_{\text{in}}/(L_1 + L_2) \]