

Phasings of Signals

• Below: plots of resonance electrical and mechanical signals vs. time, showing the phasings between them

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Complete Electrical-Port Equiv. Circuit

Static electrode-to-mass overlap capacitance

$l_x = m$

$c_x = \frac{1}{k} \frac{1}{N^2 \epsilon_0} \approx 4 \text{ fF}$

$r_x = b$

$\eta_{e1} = V_P \frac{\partial C_1}{\partial x} = V_P \frac{C_{o1}}{d_1}$

$\eta_{e2} = V_P \frac{\partial C_2}{\partial x} = V_P \frac{C_{o2}}{d_2}$

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Condensed Equiv. Circuit (Symmetrical)

Holds for the symmetrical case, where port 1 and port 2 are identical

If $\eta_{e1} = \eta_{e2}$, then ...

where

$$\begin{cases} L_x = \frac{m}{\eta_e^2} \\ C_x = \frac{\eta_e^2}{k} \\ R_x = \frac{b}{\eta_e^2} \end{cases}$$

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