
Bounded Disturbance Amplification in Mass Chains

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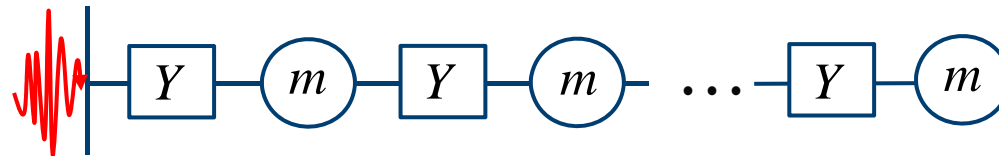


UKACC PhD Presentation Showcase

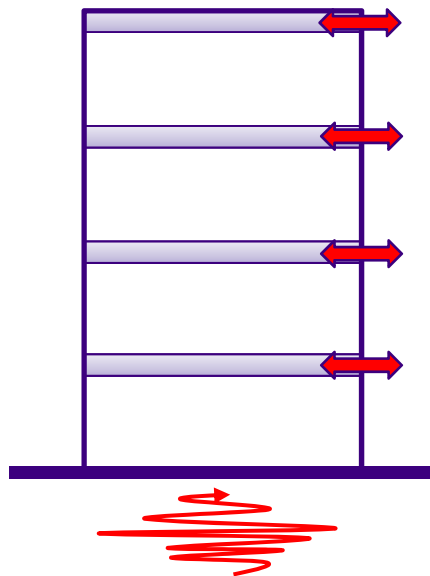


Main Topic

➤ Disturbance amplification in mass chains

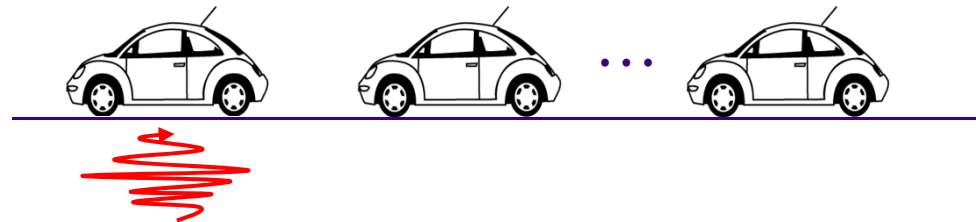


Y: mechanical admittance



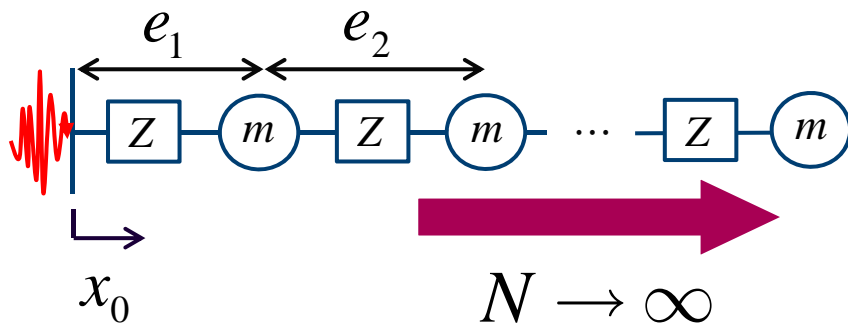
Applications

- Vibration suppression in tall buildings subjected to earthquakes
- Spacing control in vehicle platoons



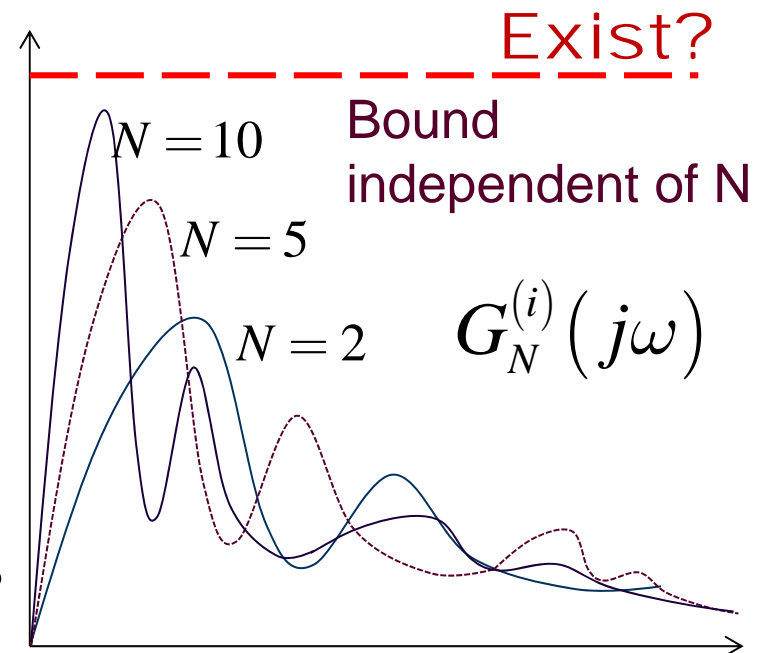
Intermass Disp. Transfer Functions

- **Transfer function from a movable point displacement to a given intermass displacement.**
 - *Is it possible to achieve uniform boundedness of these transfer functions?*



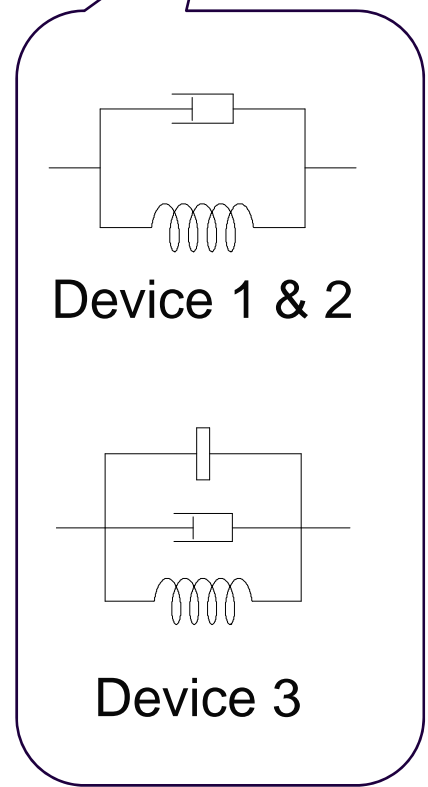
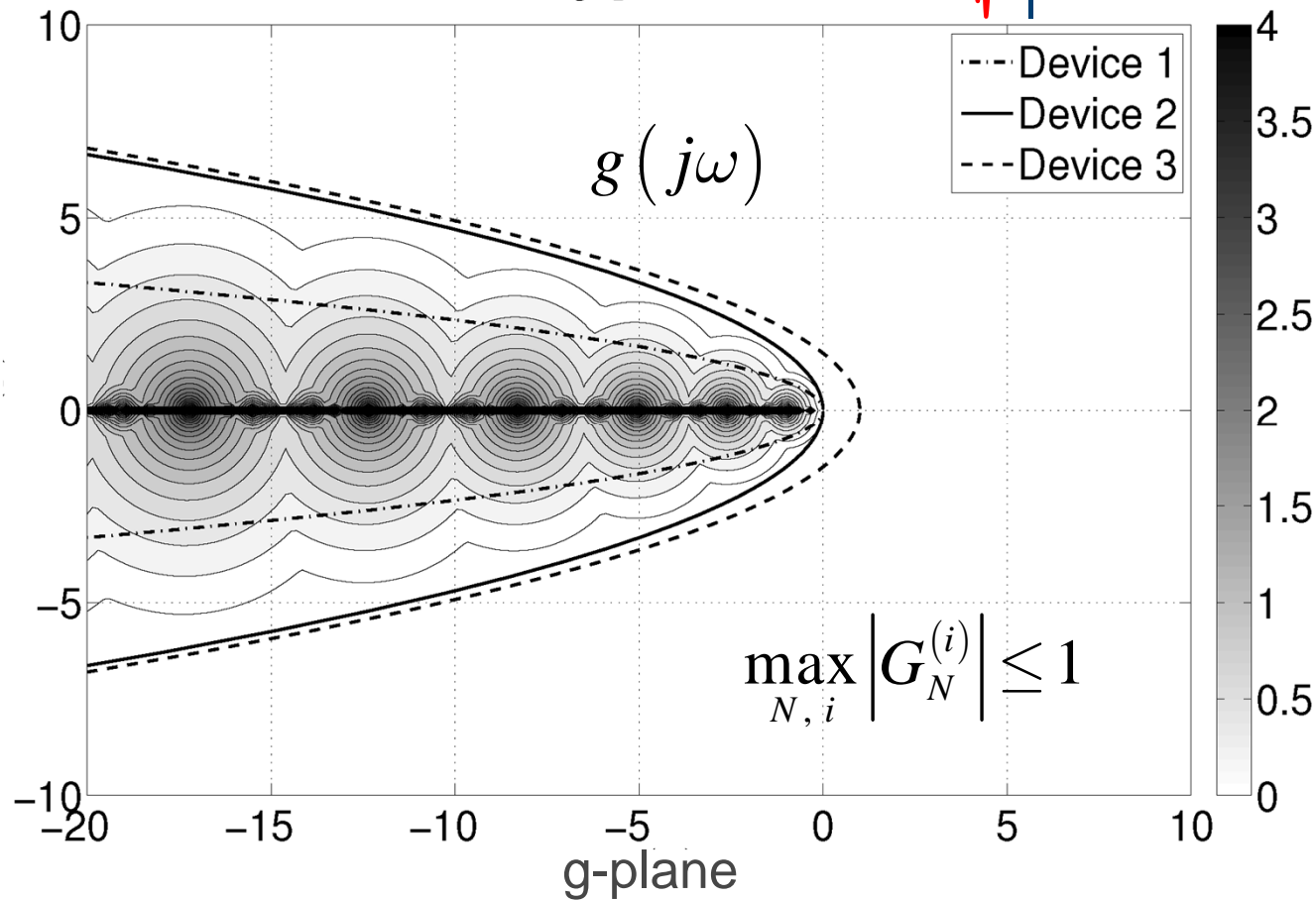
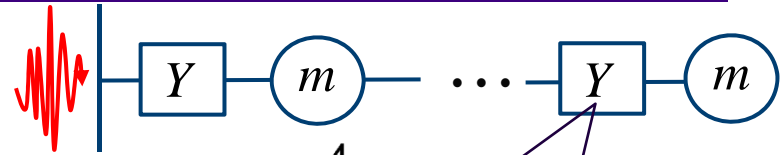
$$G_N^{(i)}(s) := \frac{e_i(s)}{x_0(s)}$$

in a chain of N masses



Graphical Representation

$$G_N^{(i)} = f(G_{N-1}^{(i)}, g), \quad g = Y(s)/(ms)$$



Summary and Future Work

➤ Main Focus

- *Uniform boundedness of the transfer function from a movable point disp. to a given intermass disp. in mass chains*

➤ Main Results

- *Graphical representation*
- *Analytical proof*

➤ Future Work

- *Design the interconnection*
- *Different topology*