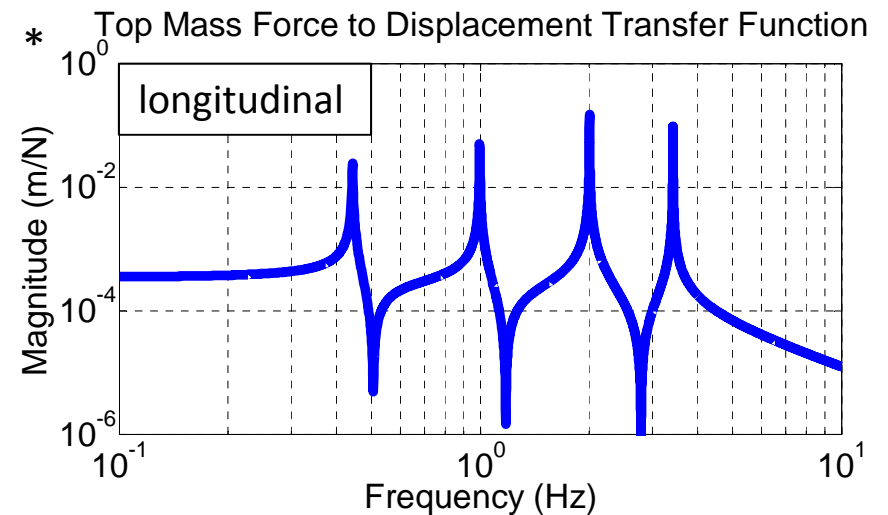
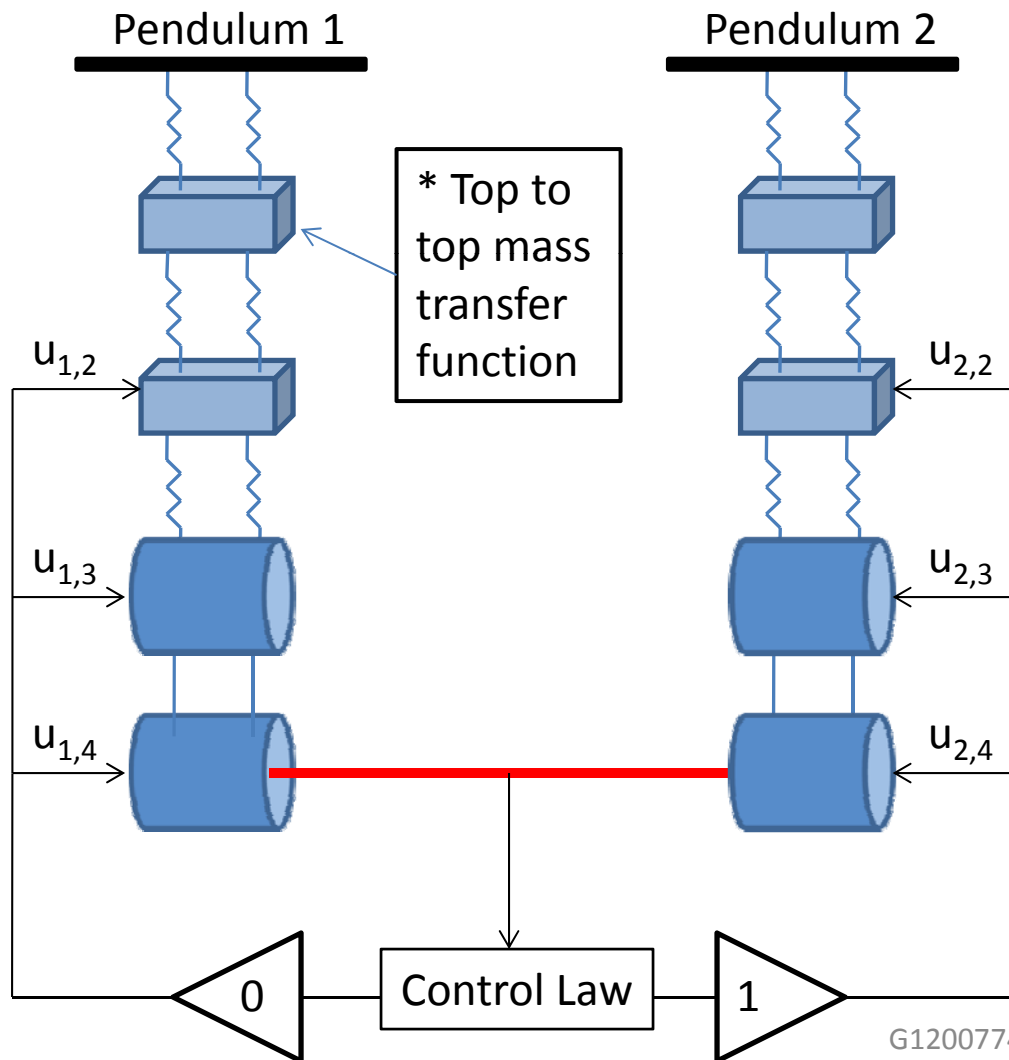


# Cavity Control Influence on Damping

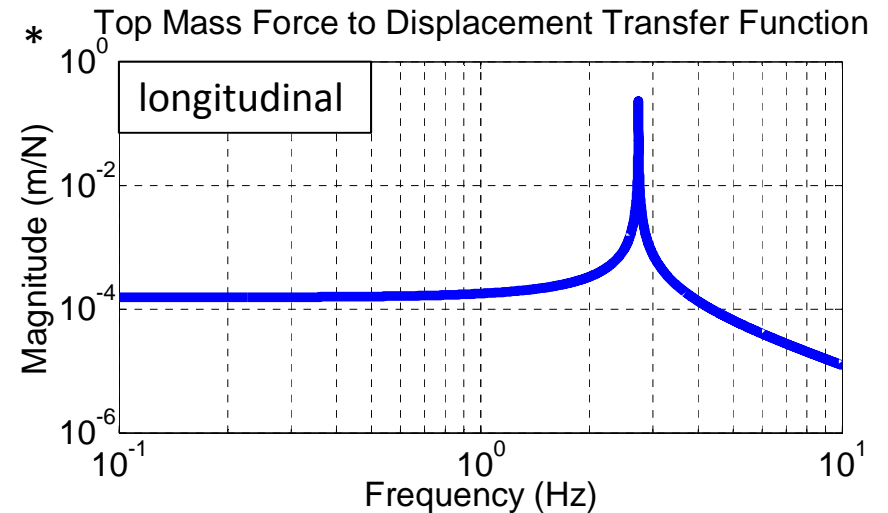
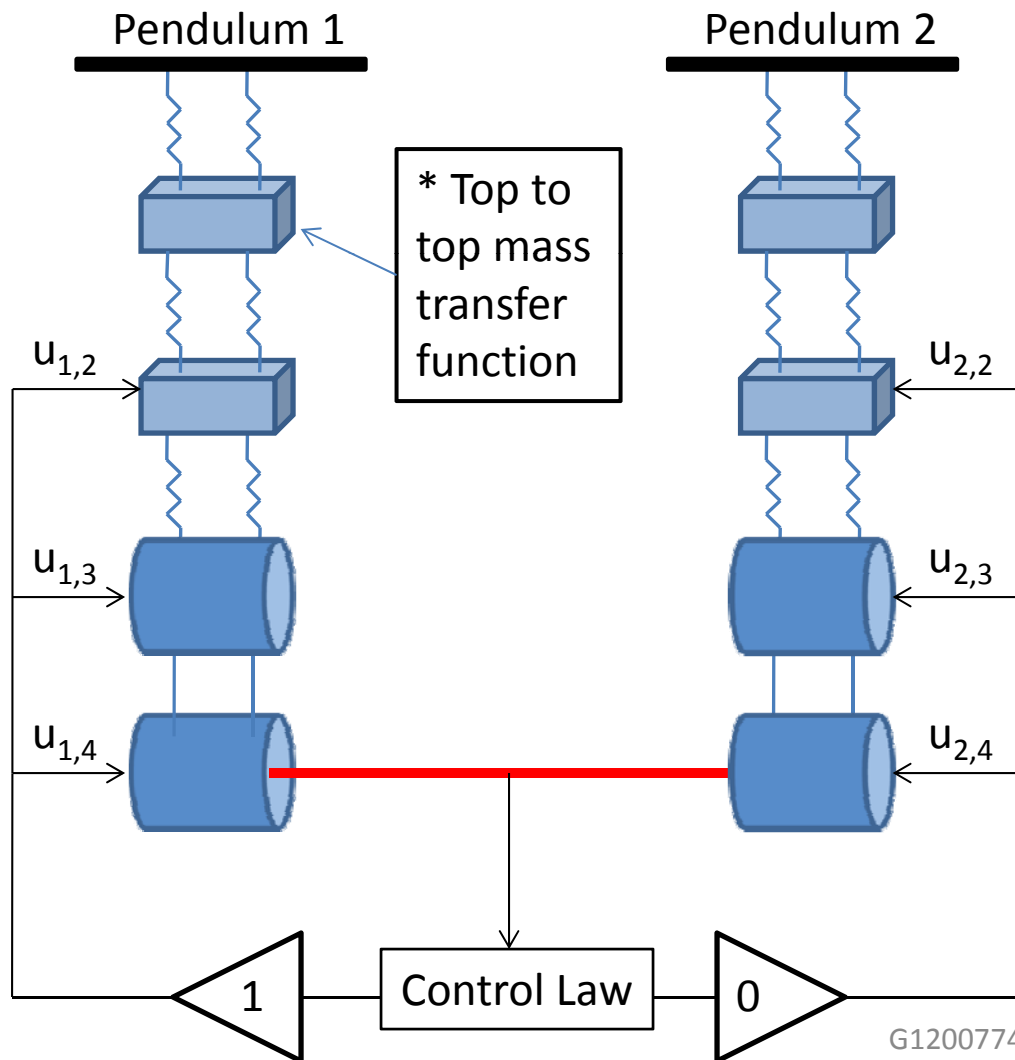
- Case 1: All cavity control on Pendulum 2



- What you would expect – the quad is just hanging free.
- Note: both pendulums are identical in this simulation.

# Cavity Control Influence on Damping

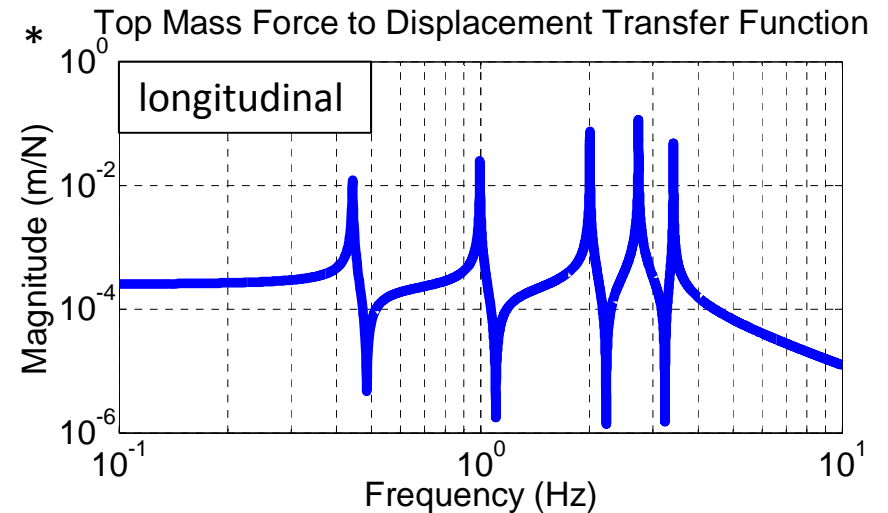
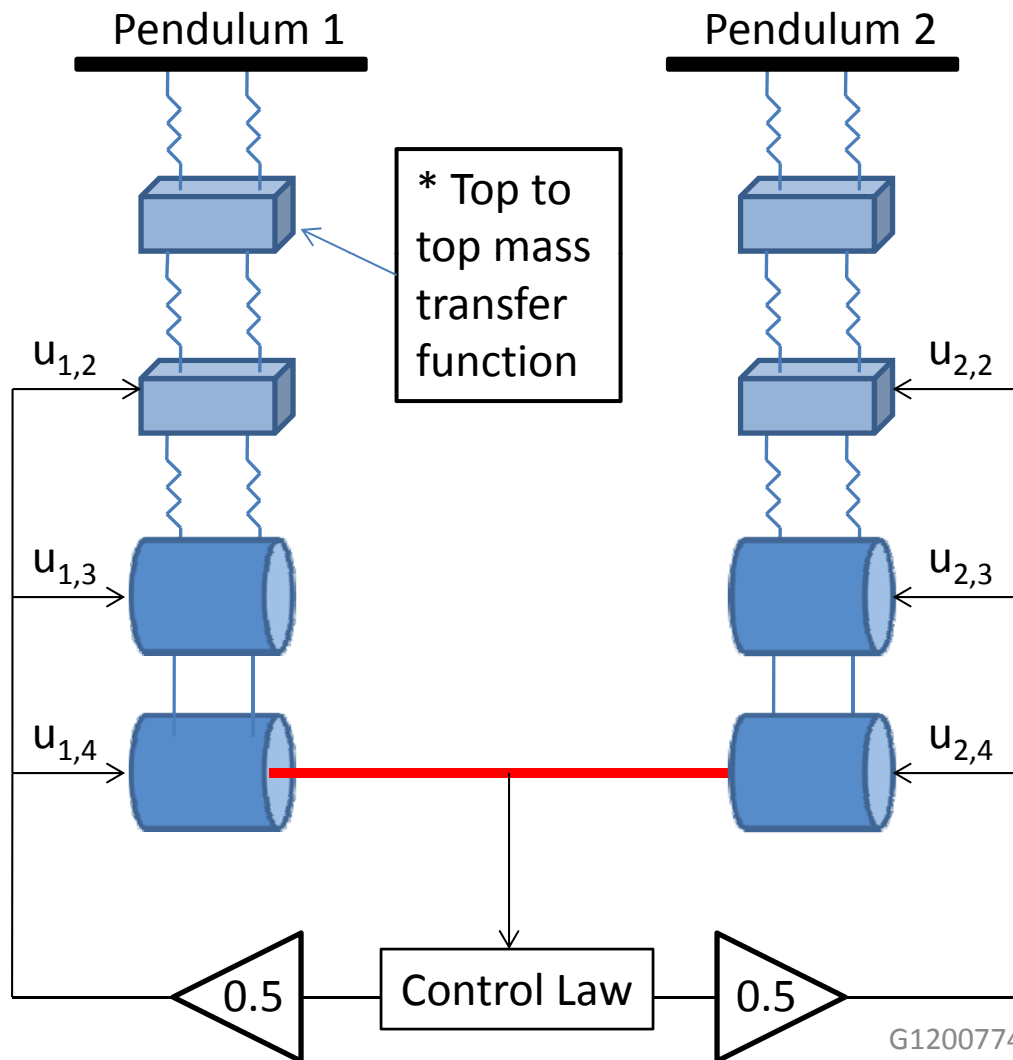
- Case 2: All cavity control on Pendulum 1



- The top mass of pendulum 1 behaves like the UIM, PUM, and test mass are clamped to gnd.
- This happens when the ugfs of the UIM, PUM, and test mass loops are above the quad's resonant frequencies.

# Cavity Control Influence on Damping

- Case 3: Cavity control split evenly between both pendulums



- The top mass response is now an average of the previous two cases -> 5 resonances to damp.
- Control up to the PUM, rather than the UIM, would yield 6 resonances.
- aLIGO will likely behave like this.