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# Variable damper via contact driven buckling mode transition

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## ABSTRACT

This study investigates a variable damper utilizing contact-driven buckling mode transition. Developing adaptable damping mechanisms capable of responding actively and effectively to changing operational environments has become increasingly important in various engineering fields, such as automotive, aerospace, and civil engineering. To address this, we propose a variable damper concept based on an energy dissipation mechanism involving contact-driven buckling mode transition introduced in previous research. The mechanism actively controls damping force and energy dissipation by adjusting the length of energy-dissipating columns, thereby allowing active control of the energy dissipation characteristics. Through theoretical analysis and numerical simulations, the damper demonstrated energy dissipation performance and variability. The proposed design can efficiently respond to varying external conditions without requiring complex control systems.

## REFERENCES

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