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Method for Improving Switching Time in Severely Underdamped Fringing-Field Electrostatic MEMS Actuators

An explicit algebraic expression calculates voltage and timing parameters to drastically improve switching times for underdamped microelectromechanical system actuators.

Electrostatic actuation is a common method used to drive microelectromechanical system (MEMS) devices achieved by applying a voltage difference between opposite electrodes of a deformable capacitor. Fringing is the field lines that occur outside of the contained field.

Purdue University researchers have developed an explicit algebraic expression that allows the calculation of time and voltage parameters of an input voltage signal that improves the switching times of severely underdamped MEMS actuators based on fringing-field actuation. Currently, no explicit analytical expressions exist to calculate the voltage and timing parameters of the input bias waveform.

Advantages:

-Allows calculation of voltage and timing parameters

-Improves switching time

Potential Applications:

-Microelectromechanical Engineering

TRL: 5

Intellectual Property:

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