

## Dynamics Characterizations of Dielectric Electro- Active Polymer Pull Actuator for Vibration Control□

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**Abstract :** The elastomeric dielectric material has become a new alternative for actuator technology recently. The characteristic of dielectric elastomer that induces significant strain by applying voltage attracts the attention of many researchers to study this material in actuator technology. Thus, for a couple of years, Danfoss Ventures A/S has established their dielectric electro-active polymer (DEAP), which called Polypower. The main objective of this work was to investigate the characterization of PolyPower folded actuator as a 'pull' actuator for vibration control. A range of experiment was carried out on folded actuator including passive (without electrical stimulate) and active (with electrical stimulate) testing. For both categories static and dynamic testing have been done to determine the behavior of folded DEAP actuator. Voltage-Strain experiment determines that DEAP folded actuator is the non-linear system. The voltage supplied has no effect on the natural frequency which shows by ongoing dynamic testing. Finally, varies AC voltage with different amplitude and frequency has been provided to DEAP folded actuator. This experiment shows the parameter that influences the performance of DEAP folded actuator. As a result, the actuator performance dominated by the frequency dependence of the elastic response and was less influenced by dielectric properties.

**Keywords :** elastomeric dielectric, dielectric electro-active polymer, folded actuator, voltage-strain

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