Characteristics of Carbon Reinforced Piezoelectric Composite

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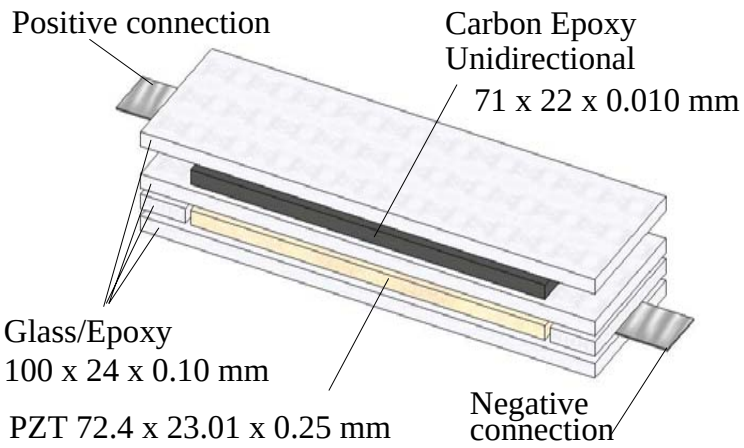
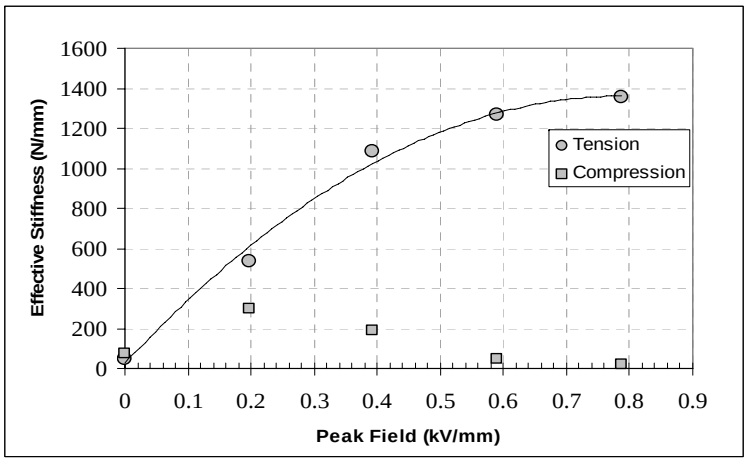
Lipca-C2

- Light Weight Piezoceramic Composite Actuator
- Carbon Reinforced Composite



Effective Stiffness

- Effective stiffness is calculated by taking the inverse of the effective compliance
- Effective compliance is determined by subtracting the magnitude of the load displacement curve at zero field from the magnitude of the load displacement curve at higher fields.

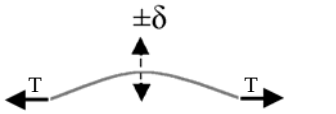


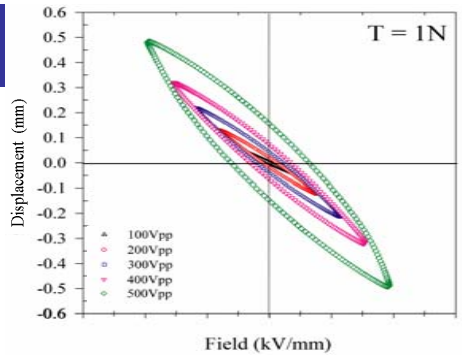
Abstract

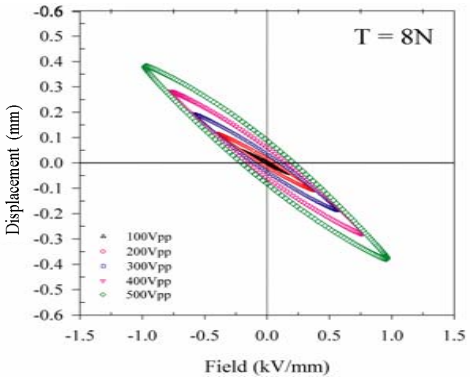
Pre-stressed piezoelectric Unimorphs have enhanced durability, strength, and out-of-plane displacement, when compared to piezoelectric materials alone. This study concentrates on the characterization of Lipca devices through surface mapping and out-of plane displacement in tension and compression.

Applied Load Vs. Electric Field

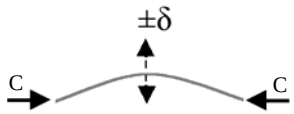
Tension

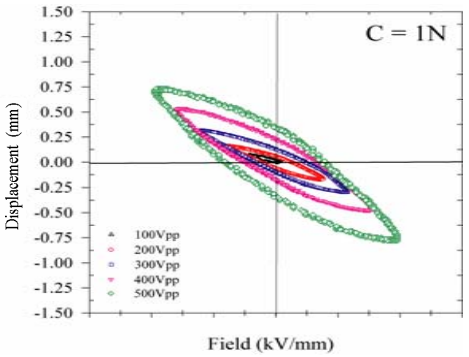


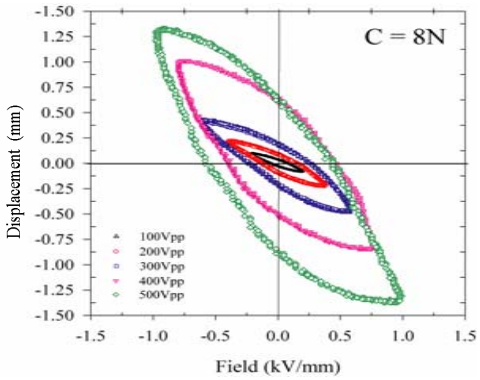




Compression







Conclusions

- The device shows exponentional increases in displacement under compressive loading at the expense of actuator rigidity as is evident from the magnification of hysteresis.
- The two distinctive responses diminstrate the possibility of tailoring actuator preformance in order to meet the needs imposed by various applications.

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