

Piezoelectric T-beam Actuators

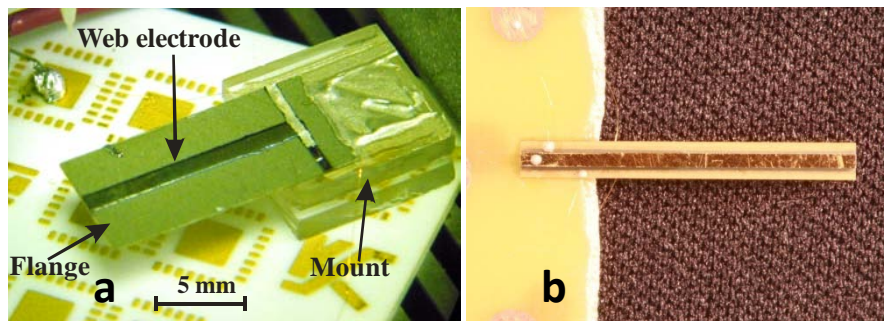
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Motivation

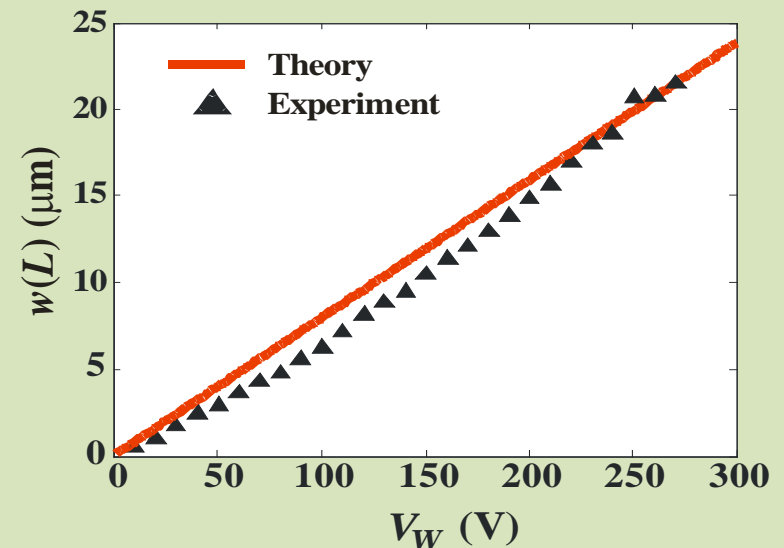
- Piezoelectric T-beam actuators provide both in-plane and out-of-plane motion. Also, as the fabrication does not involve bonding between two layers initial curvature of the devices is avoided unlike traditional unimorph actuators.

Project Status and Results

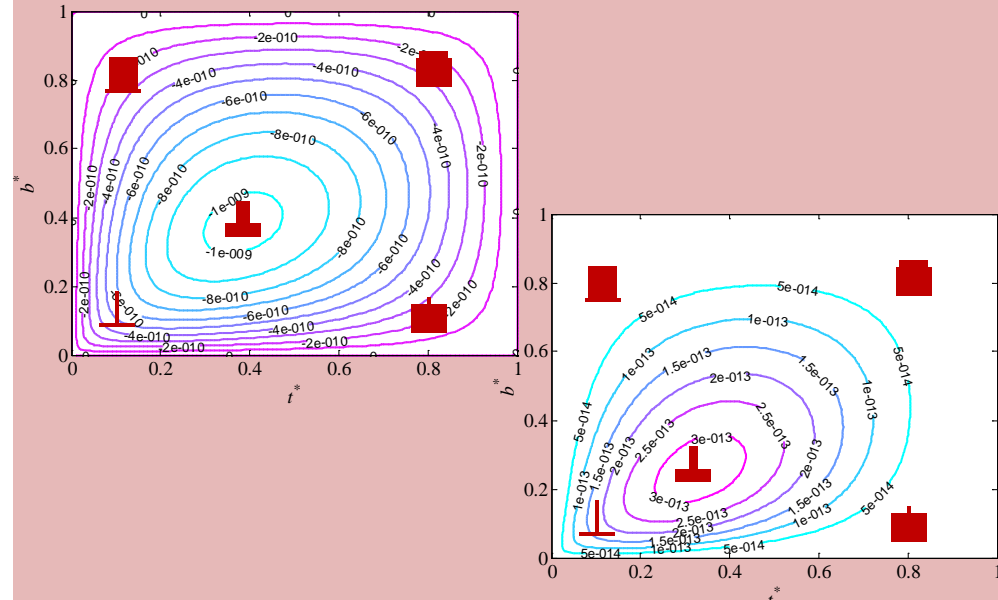
- Displacement and blocking force of T-beam actuators are modeled for both web actuation and flange actuation.
- T-beam actuators are successfully fabricated by both MEMS etching process and dicing using a precision saw.
- Optimization of T-beam is completed and detailed prototyping and testing is under progress.



Fabricated (a) micro-machined T-beam, and (b) diced T-beam



Experimental Validation with micro-machined T-beam



Optimization of T-beam showed that ratio of web thickness to total width of 0.381 and 0.25, and flange thickness to total height of 0.381 and 0.33 would produce maximum blocking force and maximum mechanical energy respectively.