Electronic Supplementary Material (ESI) for Soft Matter.

Supplemental Material

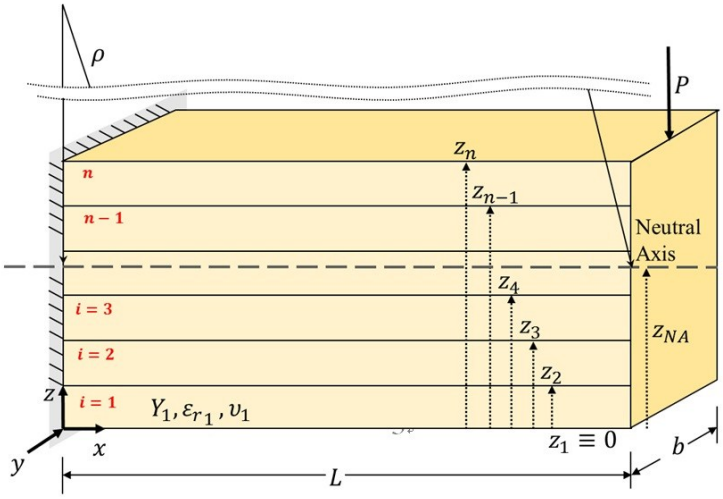

Figure S1. Model of a generic unimorph structure.

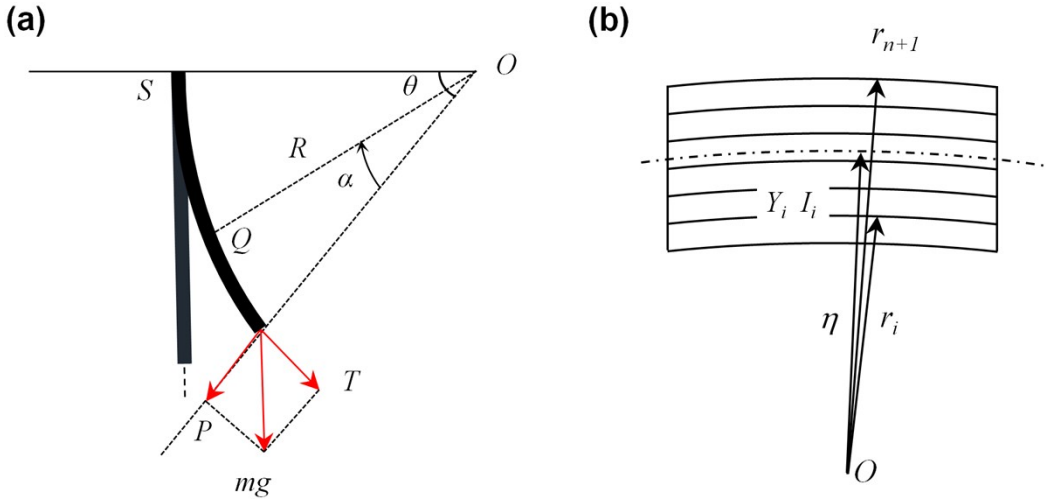

Figure S2. (a) Shape of VSDEA under applied actuation voltage, with forces acting on tip, (b) configuration of VSDEA lamina with associated parameters.

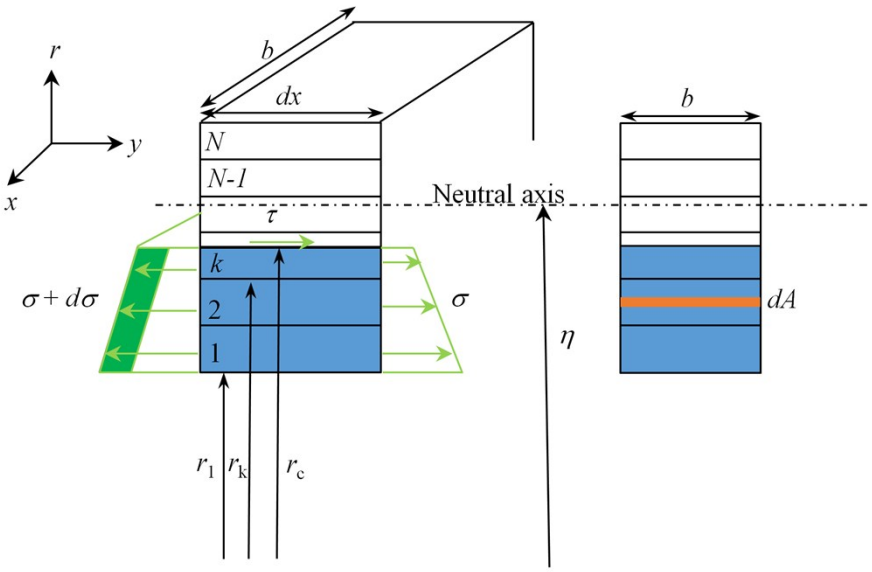

Figure S3. Balance of forces acting on an arbitrary element of VSDEA.

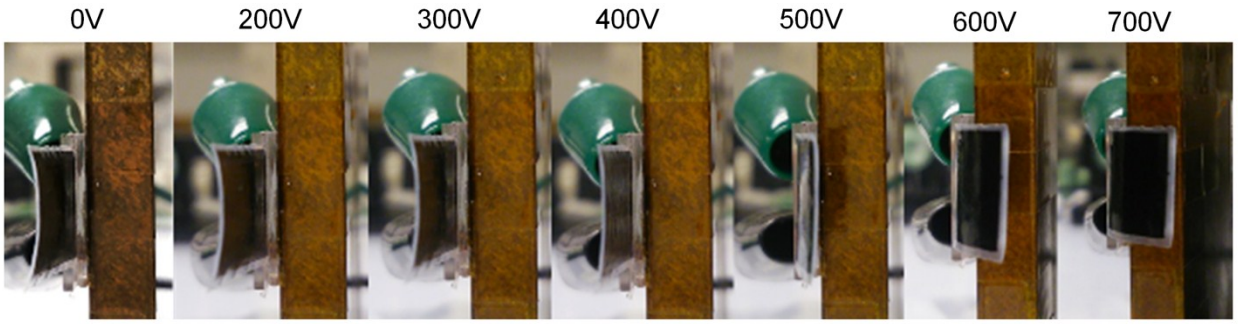

Figure S4. Progression of lengthwise and widthwise curvature of a single DEA unit during actuation.

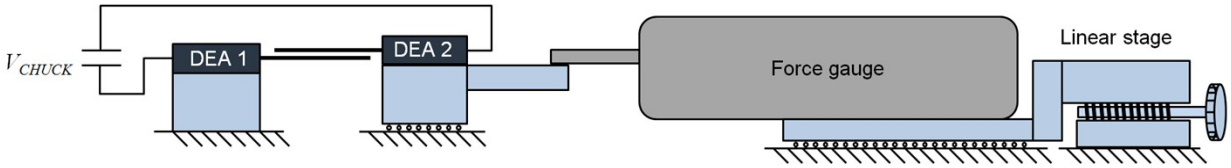

Figure S5. Experimental setup for measurement of DEA unit interface shear strength under electrostatic chucking.

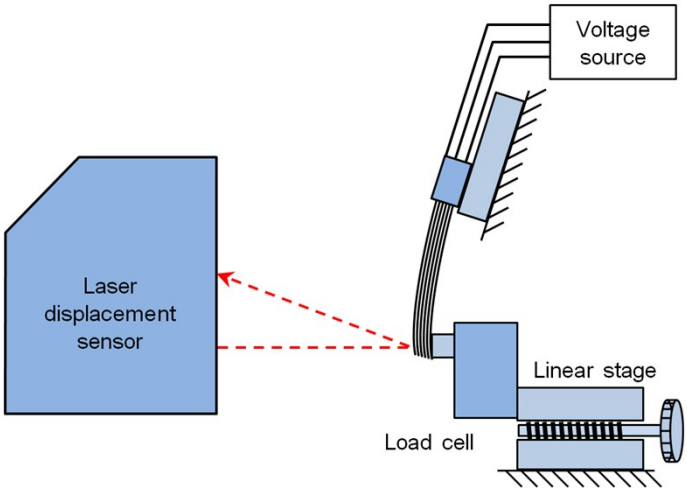

Figure S6. Experimental setup for measurement of VSDEA bending stiffness.

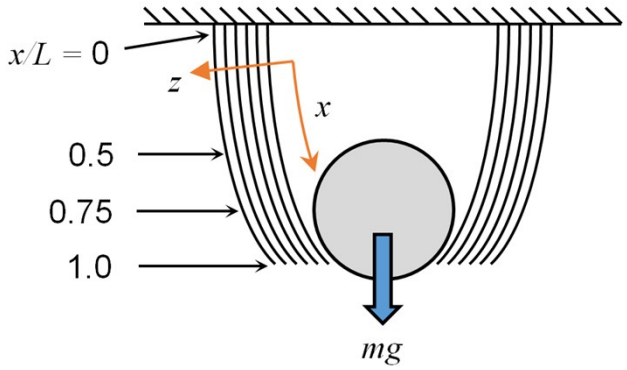

Figure S7. Schematic of claw actuator gripping a weight, with parameters used for shear stress prediction.

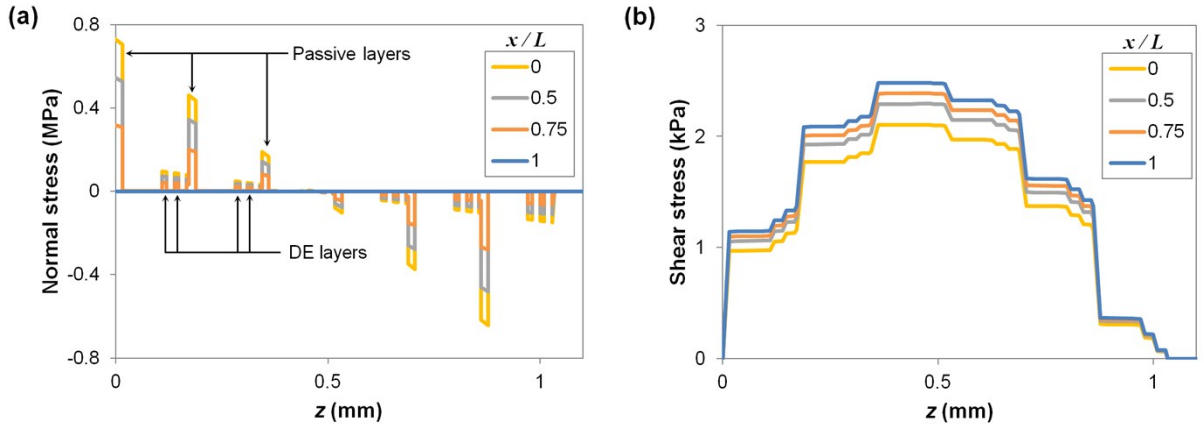

Figure S8. (a) Normal and (b) shear stress distribution in claw actuator subjected to 10g tip load.

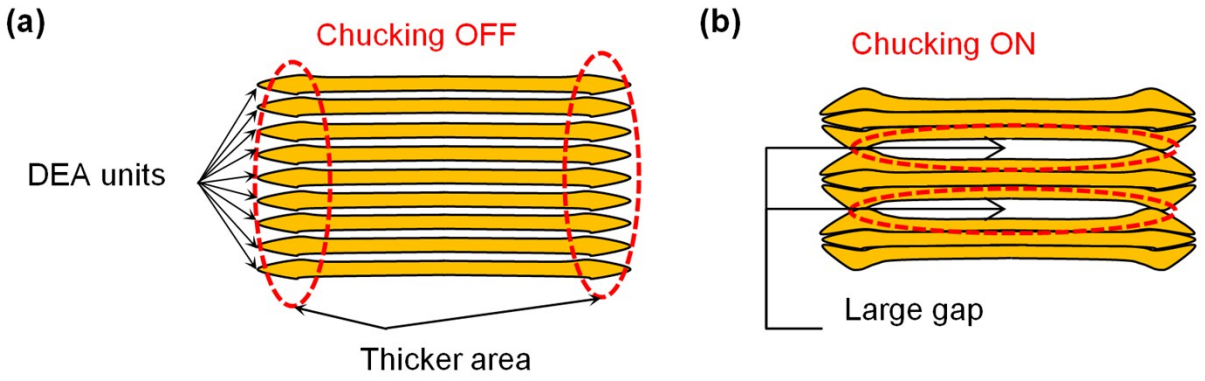

Figure S9. Inhomogeneous thickness of DEA units causing formation of gaps between units, showing (a) chucking voltage turned off, and (b) chucking voltage turned on.

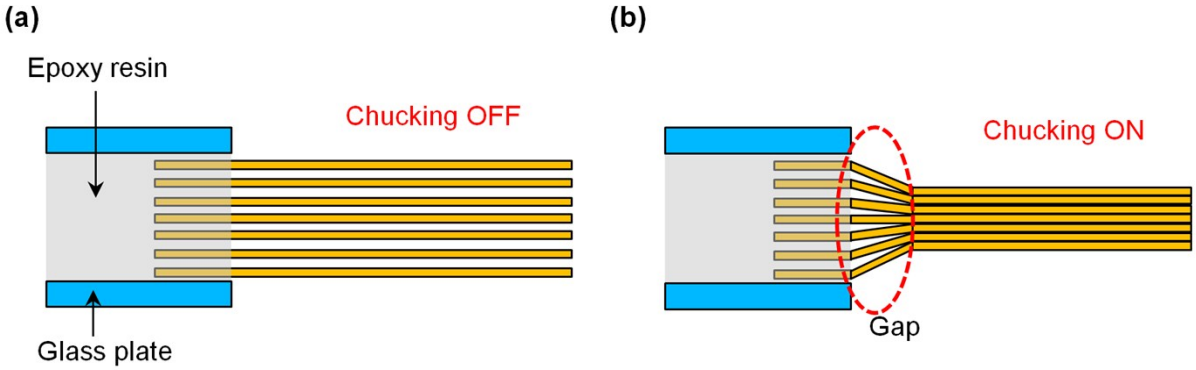

Figure S10. Formation of gaps near VSDEA root, showing (a) chucking voltage turned off, and (b) chucking voltage turned on.

Table S1. Summary of DEA unit geometric and material parameters.

	Thickness	**Young's modulus**	**Poisson's ratio**	**Dielectric constant**
DE layer	10.6 μm	250 MPa	0.5	50
Electrode layer	18.7 μm	4.02 MPa	0.5	-
Insulator layer	56.3 μm	1.00 MPa	0.5	-
Passive layer	16.1 μm	1720 MPa	0.35	-