

Abstract Submitted  
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**Large, Uni-directional Actuation In Dielectric Elastomers Achieved By Fiber Stiffening**<sup>1</sup> JIANGSHUI HUANG, DAVID CLARKE, ZHIGANG SUO, Harvard University — Cylindrical actuators are made with dielectric elastomer sheets stiffened with fibers in the hoop direction. When a voltage is applied through the thickness of the sheets, large actuation strains are achievable in the axial direction, with or without pre-straining and mechanical loading. For example, actuation strains of 35.8% for a cylinder with a prestrain of 40%, and 28.6% for a cylinder without pre-strain have been achieved without any optimization. Furthermore, the actuation strain is independent of the aspect ratio of the cylinder, so that both large strains and large displacements are readily actuated by using long cylinders.

<sup>1</sup>Large, Uni-Directional Actuation In Dielectric Elastomers Achieved By Fiber Stiffening

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