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**The Thickness And Stretch Dependence Of The Electrical Breakdown Strength Of An Acrylic Dielectric Elastomer** JIANGSHUI HUANG, ZHIGANG SUO, DAVID CLARKE, Harvard University — The performance of dielectric elastomer actuators is limited by electrical breakdown. Attempts to measure this are confounded by the voltage-induced thinning of the elastomer. A test configuration is introduced that avoids this problem: A thin sheet of elastomer is stretched, crossed-wire electrodes attached, and then embedded in a stiff polymer. The applied electric field at breakdown  $E_B$  is found to depend on both the deformed thickness,  $h$ , and the stretch applied,  $\lambda$ . For the acrylic elastomer investigated, the breakdown field scales as  $E_B = 51 h^{-0.25} \lambda^{0.63}$ . The test configuration allows multiple individual tests to be made on the same sheet of elastomer.

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