

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Highly Deformable Liquid Embedded Soft-Matter Capacitors and Inductors for Stretchable Electronics ANDREW FASSLER, CARMEL MAJIDI, Carnegie Mellon University — We have developed a family of soft-matter capacitors and inductors that can be stretched to several times their natural length. These circuit elements are composed of microchannels of a liquid-phase Gallium-Indium-Tin alloy (Galinstan) embedded in a soft silicone elastomer (Ecoflex[®] 00-30). As the elastomer stretches, the embedded liquid channels deform, causing the capacitance and inductance to change monotonically. The relative changes in capacitance and inductance are experimentally measured as a function of stretch in three directions. The relationships found show potential for these devices to be used as strain sensors and tunable electronic filters. Additionally, theoretical predictions derived using finite elasticity kinematics are consistent with these experimentally found relationships.

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Date submitted: 09 Nov 2012

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