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**Magnetostriction of engineered magnetorheological elastomers**  
WILLIAM RIEGER, CHRIS KASSNER, PARIS VON LOCKETTE, SAMUEL LOFLAND, Rowan University — We have completed a study of the magnetostriction and poisson ratio of several types of magnetorheological elastomers (MREs), including both hard and soft magnetic materials in silicone rubber matrices. While both random and aligned soft magnetic particles gave large ( $\sim 1\%$ ) magnetostriction, hard magnetic powders provided minimal actuation, regardless of whether they were aligned or not. In addition, we have created engineered lattices of magnetic wires and find the actuation highly dependent on the sample shape, and the angle of the magnetic field with respect to the alignment axis. We also propose some new structures based on hard magnetic wires which should provide piezomagnetic response.

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