

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Achieving Novel Relaxor Ferroelectric Behavior in a Nylon Terpolymer** ZHONGBO ZHANG, LEI ZHU, MORTON LITT, Case Western Reserve Univ — Novel ferroelectric polymers, featured by narrow electric displacement-electric (D-E) loops, are attractive for electric energy storage applications due to their high dielectric constant and low loss properties. Currently, only poly(vinylidene fluoride) (PVDF)-based copolymers (e-beamed) and terpolymers show this behavior due to the formation of nanodomains. It is desirable to achieve novel ferroelectricity in other polar polymers such as nylons by modifying the crystal structure. In this presentation, a terpolymer of nylon 11, nylon 12 and N-methylated nylon 11 are synthesized, which show narrow D-E loops. The purpose of copolymerizing nylon 11 and nylon 12 is to introduce chemical defects (i.e., dangling amide groups) in the mesomorphic phase and to achieve nanodomains. The bulky N-methylated nylon 11 comonomers serve for the physical pinning effect. With the help of copolymerization and the pinning effect, the nylon terpolymer exhibits narrow D-E loops at elevated temperatures.

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Date submitted: 12 Nov 2016

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