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Acoustic and ultrasonic characterization constraints of self-healing (ethylene-co-methacrylic acid) copolymers KENNETH PESTKA II, JONATHAN BUCKLEY, Longwood University, STEPHEN KALISTA, Department of Biomedical Engineering, Rensselaer Polytechnic Institute, NICHOLAS BOWERS, Rolins College — Recent experiments indicate that small sample poly (ethylene-co-methacrylic acid) copolymers (EMAA copolymers) exhibit time dependent variation in their acoustic and ultrasonic resonant spectra after exposure to a damage event. However, due to the relatively soft nature of these thermoplastic materials, several experimental constraints affect efficacy of resonant spectral analysis. In this work we will the address the effect of several characterization constraints on a self-healing EMAA ionomer (commercially known as Dupont Surlyn 8920) including the effects of transducer loading, continuous rapid resonant excitation and temporally separated long-term resonant excitation. In some circumstances, these experimental constraints can influence the time dependence of sample resonant frequency evolution, quality factor, and variation in spectral waveform. By quantifying these effects, robust characterization of post-damage self-healing EMAA samples is possible and will be presented.

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