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**Memory Effects of Multistage Crosslinking and Scission on Stress in Polymer Networks** JOANNE BUDZIEN, Physics and Engineering Department, Frostburg State University — While the independent network model (INM) typically used for polymers is excellent for networks that truly are independent, the model has to be modified for networks that are not independent. Such dependent networks can be the result of scission occurring in strain states where crosslinking also occurs. The overall material retains a memory of the strain/crosslinking/scission history because of the bias in how the crosslinks are introduced. These memory effects mean that the resulting zero-stress state (the shape to which the sample will return at equilibrium) varies depending on the sample preparation history, in contrast to the INM where only the number of crosslinks in each network should matter. In this talk, I will present recent results of molecular dynamics simulations where coarse-grained polymer models undergo sequential crosslinking and scission in multiple strain states. The effects of entanglements will also be considered.

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