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Localized Memory Effect of Elastomers Filled with Nanoparticles SHOUBO LI, XIAORONG WANG, Chemical Engineering, Tongji University, Shanghai — When a filler-reinforced elastomer compound is oscillatory sheared or pressed at a small fixed strain (e.g., 2%) for a period of time, it can produce a localized memory perturbation in its dynamic spectrum. Typically, a localized memory appears near the applied strain amplitude in the loss modulus spectrum. Sequential holding the system at two strains can produce one or two holes depending on the deformation histories. While this discovery of localized memory effect seems to be significant and compelling, its generality in vulcanized elastomers containing various fillers has not yet been tested extensively. In this work, we intend to expand on our previous work of a colloidal silica-filled model system to carbon black-filled real rubbers. We also examine the effect of filler volume fraction in rubber compounds on the spectral memory phenomenon.

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