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Heterogeneity of the structural relaxation of jammed state in particle-filled elastomers XIAORONG WANG, Bridgestone Americas, Center for Research and Technology, CHRISTOPHER ROBERTSON — The Payne effect is a low-strain hysteretic softening in particle-filled elastomers which we recognize as part of jamming physics [1-2]. We find that in particle-filled elastomers aging at a fixed oscillatory strain γ_a produces a spectral hole in the loss modulus vs strain spectrum which is localized near the aging strain [3]. Sequential aging at two strains reveals that when $\gamma_{a1} > \gamma_{a2}$ the resulting dynamic spectra appear to be a combination of that aged at γ_{a1} and γ_{a2} ; whereas for $\gamma_{a1} < \gamma_{a2}$, the resulting dynamic spectra only reflect the characteristic hole burning of the second strain after holding at γ_{a2} . This remarkable behavior of particle-filled elastomers suggests that structural relaxations in jammed state are heterogeneous and aging at a fixed strain γ_a only affects part of the relaxation spectra.

- [1] *Phys. Rev. E*, **2005**, 72 (3), 031406;
- [2] *Phys. Rev. Lett.*, **2005**, 95, 075703;
- [3] *Europhys. Lett.*, **2006**, 76(2) 278.

Xiaorong Wang
Bridgestone Americas, Center for Research and Technology

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