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Steady state structure factor and stress in sheared semi-dilute polymer solutions PRASANTH JOSE, GRZEGORZ SZAMEL, Department of Chemistry, Colorado State University, Fort Collins, Colorado 80523 — We use Brownian dynamics simulations to elucidate the contributions of intra and inter chain correlations to anisotropic scattering patterns observed in light scattering experiments on sheared semi-dilute polymer solutions (Wu et al., Phys. Rev. Lett. 66, 2408 (1991)). We find that while in equilibrium solutions the contributions to structure factor from intra and inter chain correlations cancel each other almost completely, under shear these contributions are modified in different ways resulting in incomplete cancellation and the formation of anisotropic scattering patterns. We also investigate the contribution of intra and inter chain correlations to shear stress and viscosity, and to the shear stress relaxation.

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