Abstract Submitted
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Flow mechanism of colloidal solutions under shear revealed by neutron scattering and simulation[1] XIN LI, WEI-REN CHEN, LUIS SANCHEZ-DIAZ, Oak Ridge National Laboratory, YUN LIU, National Institute of Standards and Technology, LIONEL PORCAR, Institut Laue-Langevin, WILLIAM HAMILTON, CHANGWOO DO, Oak Ridge National Laboratory, TAKUYA IWASHITA, TAKESHI EGAMI, KAO-HSIANG LIU, University of Tennessee — Using small angle neutron scattering technique and Brownian dynamics simulation we investigate the effect of external steady shear on the concentrated solutions of silica particles in the shear thinning region. Three dimensional anisotropic structure factors are obtained as a function of shear rate. Accordingly the evolution of local topology, defined by the colloidal connectivity, is revealed by the variation of local strain. We further determine the elastic responsive length scale of the colloidal systems via characterizing the quantitative dependence of the correlation length on the strain rate.

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