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Effect of particle stiffness on glassy dynamics of dense colloidal liquids in the Bulk and Confined Regimes RAYMOND SEEKELL, University of Notre Dame, PRASAD SARANGAPANI, MedImmune, LLC, One Medimmune Way, Gaithersburg, MD 20878, YINGXI ZHU, University of Notre Dame — "Fragile" glassy materials show a non-Arrhenius dependence of relaxation time with temperature close to the glass transition and have been extensively studied for molecular glass formers as model "hard-sphere" colloidal suspensions, but we lack a complete understanding of "strong" glass formers which show an Arrhenius dependence on temperature approaching the glass transition. In this work, we investigate the glassy dynamics of microgels of varied particle stiffness in dense aqueous suspensions using confocal microscopy. Poly(N-isopropylacrylamide) (PNIPAM) microgel particles of variable stiffness in aqueous media are synthesized by free radical polymerization with varied cross-linking density. We investigate five separate crosslinking densities to fully encompass the transition from "soft" to "stiff" glasses. We have observed that the dynamic heterogeneity is more pronounced as stiffness increases, indicating the effect of fragility on glassy dynamics of dense colloidal liquids. Furthermore, when the "soft" glasses are confined between two solid surfaces at a gap spacing of several particle diameters, particle motions become arrested with notably increasing dynamic length scales at smaller volume fractions, suggesting the enhanced fragility by special confinement.

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