Abstract Submitted
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Segmental chain dynamics of ABA triblock copolymer micelles in aqueous solution[1] VIVEK PRABHU, GUANGMIN WEI, NIST Material Measurement Laboratory, MICHIHIRO NAGAO, NIST Center for Neutron Research, SHRINIVAS VENKATARAMAN, YI YAN YANG, AStar-Singapore, Institute of Bioengineering and Nanotechnology, JAMES HEDRICK, IBM Almaden Research Center — The polymer physics of hierarchical, aqueous self-assembled ABA block copolymers is an active area of research for both advanced materials and biomaterial applications [1]. Scattering-based techniques provide a direct measure of the correlations and structure across multiple length and time scales. Hierarchical clusters of micelles are formed by well-defined poly(ethylene glycol) triblock copolymers with oligo-fluorene hydrophobic end-groups in aqueous solutions. The structure and dynamics of this system was studied by small-angle neutron scattering (SANS), and static and dynamic light scattering [2]. We will present new neutron spin-echo spectroscopy (NSE) results that provides direct insight into the segmental chain dynamics constrained by the pi-pi stacking of the oligo-fluorene end groups. The dilute cluster regime within the temperature-composition phase diagram is of current interest. [1] S. Venkataraman, A.L. Lee, H.T. Maune, J.L. Hedrick, V.M. Prabhu, and Y.Y. Yang, Macromolecules 46, 4839 (2013). [2] V.M. Prabhu et al. "Equilibrium self-assembly, structure and dynamics of clusters of star-like micelles," ACS Macro Letters, 4, 1128 (2015).

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