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Direct imaging of entangled actin solutions CHI HANG BOYCE TSANG, LINGXIANG JIANG, KEJIA CHEN, BO WANG, STEVE GRANICK, University of Illinois at Urbana-Champaign — It is well known that the traditional tube theory of entangled polymer cannot provide a full picture of microscopic heterogeneity. However, problems on modern topics such as nanocomposites and cell motility require us to understand microscopic details of such systems. In order to study their dynamics, direct imaging of entangled biopolymer, F-actin, was carried out. With our experimental technique it was possible to achieve sub-diffraction resolution on sparse points of a polymer, and simultaneously to observe the geometry of the contour. This enabled quantification without assumption about structure factor or the specific type of dynamical model. Preliminary results show that diffusion along the chain contour shows distinct variations according to spatial position even at constant polymer length. This may imply that, on a single polymer level, effects from heterogeneities could override mean field descriptions.

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