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Non-equilibrium, motor-driven active DNA hydrogels BYOUNG-JIN JEON, DEBORAH FYGENSON, OMAR SALEH, University of California Santa Barbara — We have explored the molecular motor-driven, non-equilibrium mechanics of an artificial hydrogel system. We have synthesized DNA hydrogels with embedded tracer particles using highly specific, tunable DNA hybridization. The hydrogel's mechanical properties are varied by preparing composite gel systems that contain an appreciable fraction of stiff filaments (DNA origami nanotubes) linked to flexible DNA strands in the gels. We posit that these stiff filaments help the motor-induced strain propagate further. We employ microrheological techniques to probe the temporal and spatial strain fields created by contractile forces driven by the activity of a protein motor, FtsK. We discuss our experimental results on this non-equilibrium network system, seeking to establish fundamental principles of motor-driven active soft matter.

Byoung-jin Jeon
University of California Santa Barbara

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