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Seeing believes: Watching entangled sculpted branched DNA in real time AH-YOUNG JEE[1], JUAN GUAN, KEJIA CHEN, STEVE GRANICK, Univ of Illinois - Urbana — The importance of branching in polymer physics is universally accepted but the details are disputed. We have sculpted DNA to various degrees of branching and used single-molecule tracking to image its diffusion in real time when entangled. By ligating three identical or varying length DNA segments, we construct symmetric and asymmetric ?Y? branches from elements of lambda-DNA with 16 um contour length, allowing for single-molecule visualization of equilibrium dynamics. Using home-written software, a full statistical distribution based on at least hundreds of trajectories is quantified with focus on discriminating arm-retraction from branch point motion. Some part of our observations is consistent with the anticipated ?relaxation through arm retraction? mechanism but other observations do not appear to be anticipated theoretically.

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