

## **221a Polymer Chain Dynamics in Viscous Flow through Ordered Arrays of Posts**

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DNA Chain dynamics in the flow through periodic arrays of posts convected under the action of a viscous driving force are simulated using Brownian dynamics. We develop an understanding of the mechanisms that lead to hooking, and thus velocity reduction and ultimately separation, in the arrays. Dispersion in the cross-stream direction is found to be of paramount importance, and is isolated as the sole mechanism by which a post-chain collision in the array can occur. We show that ordered arrays can produce separation at flow strengths comparable to those observed in random arrays. By including the disturbance fields produced by posts in the arrays we also study the effect of spatial variations in the field. These results are compared to available experimental work. We discuss these results as they apply to the design and simulation of an ordered array of posts optimized for chain stretching and separation.