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Yang Ding, Li Zhang and Longhua Zhao*, lxz315@case.edu. *Analysis of micro-fluidic tweezers in the Stokes regime.*

Nanowire fluidic tweezers have been developed to gently and accurately capture, manipulate and deliver micro objects. The mechanism behind the capture and release has not been well understood yet. Utilizing the method of regularized Stokeslet, we study a cylindrical nanowire tumbling and interacting with spherical particles in the Stokes regime. The capture phenomenon observed in experiments are reproduced and illustrated with the trajectories of micro-spheres and fluid tracers. The flow structure and the region of capture are precisely examined and quantitatively compared for different sizes of particles and various tumbling rates and dimensions of the tweezers. We found that pure kinematic effects can explain the mechanism of capture and transport of particles. We further reveal the relation between the capture region and the behavior of stagnation points in the displacement field. (Received September 27, 2017)