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Optical Microfluidic Control using induced Marangoni Effect KYLE NOBLE, KEN KOTZ, GREGORY FARIS, MOLECULAR PHYSICS LABORATORY, SRI INT. TEAM — In this attempt to demonstrate a novel method for microfluidic transport, a He-Ne laser was used to create a surface temperature gradient and therefore induce the Marangoni effect. This transport technique was designed to improve current microfluidic or "Lab on a chip," devices, which perform biological and chemical assays on a microscopic level. The apparatus used in this demonstration was a polystyrene dish, on which droplets on the orders of 1.7 μL- 14 pL, immersed in an organic solvent, were moved at 3 mm/s. To aid in this study, different organic solvents as well as different color dyes were used to increase the force applied to the droplet by the induced thermal gradient and achieve lower surface-droplet interaction. The magnitude of the force applied to the droplet is based on absorption of laser light, while the surface droplet interactions are based on surface tension and adhesion forces.

Kyle Noble

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