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Microfluidic Routing Via Dynamic Optical Lattices

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Oral Presentation O14.2

MICROFLUIDIC ROUTING VIA DYNAMIC OPTICAL LATTICES

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A number of methods have been proposed that utilize active intervention for sorting micrometer-scale particulate (possibly biological) matter suspended in microfluidic channels. A passive approach may, ultimately, offer greater potential for high throughput. We propose a passive all-optical (non-invasive) method, wherein both throughput and efficiency are inversely related to the width of the injection channel. In the regime where efficiency is high, the primary limitation is associated with jamming of the device. We analyze this effect and introduce a novel method utilizing the Angular Doppler effect to create a dynamic lattice using multibeam interference in an effort to reduce jamming in the high efficiency regime.