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**Lift-Force-Driven Microfluidic Droplet Sorting Device** HARM NIEUWSTADT, DAVID LI, ROBINSON SEDA, J. BRIAN FOWLKES, JOSEPH BULL, The University of Michigan — A long ( $\sim 5$ -7 centimeters) rectangular micro channel is used to sort perfluorocarbon (PFC) droplets by size. This study is motivated by a novel gas embolotherapy technique which aims to treat cancer by infarcting tumors with gas emboli that are formed by selective acoustic vaporization of  $\sim 6$  micrometer, intravascular, PFC droplets. Droplets smaller and larger than  $\sim 6$ -micrometer proved to be less effective, or even detrimental, in the gas embolotherapy. From a suspension of micro PFC droplets, the sorting device designed in this study eliminates droplets with higher and lower diameters than  $\sim 6$ -micrometer. This is done by the use of a difference in lateral lift force (which depends on droplet diameter) that is exerted on the droplets. When a mixture of droplets is introduced at the entrance of a straight micro channel, larger droplets will tend to move to an equilibrium position at  $0.6R$ ,  $R$  being the half width of the channel, in shorter time and distance than smaller droplets. When splitting up the end of the channel in two smaller outer channels (which contain the large droplets) and one smaller inner channel (which contains the small droplets), the droplets can, in theory, be sorted with high accuracy. This work is supported by NIH grant R01EB006476.

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